

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

c521
R44F6

5



United States
Department of
Agriculture

Prepared By:
Cooperative State
Research Service
Science and
Education

Food and Agriculture Competitively Awarded Research Grants

Fiscal Year 1981

99 25 181

99 25 181
16 0 197

FOOD AND AGRICULTURE
COMPETITIVELY AWARDED
RESEARCH GRANTS

Fiscal Year 1981

UNITED STATES
DEPARTMENT OF
AGRICULTURE

PREPARED BY:
COOPERATIVE STATE
RESEARCH SERVICE
SCIENCE AND EDUCATION

NOVEMBER 1981

FOREWORD

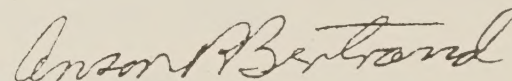
One of this country's most pressing needs is for intensified basic research in the food and agricultural sciences. We must increase our agricultural productivity, safeguard the quality of our crops and livestock, discover new controls for diseases and pests, preserve and enhance our environment, collect and use wisely the energy resources available to us, and improve the nutritional well-being of all people.

A vigorous, multidisciplinary approach to research of this scope requires a diversity of scientific talents. The science and education role in the U.S. Department of Agriculture involves such an approach among the Department's own research in Federal laboratories and in a nationwide research partnership that encompasses State agricultural experiment stations, schools of forestry, 1890 land-grant institutions and Tuskegee Institute, and colleges of veterinary medicine.

While this partnership has provided the Nation with a remarkable record of accomplishment over the years, both the Congress and USDA have recognized the need for additional research efforts in high-priority areas and for enlisting the talents of scientists outside the scope of this traditional partnership. To help meet these needs, the Competitive Research Grants Program described in this booklet has been established. USDA's Cooperative State Research Service

administers the funds for these grants, except for the solar energy grants which are administered through the Agricultural Research Service's Energy Center at Tifton, GA. During the fiscal year October 1, 1980 to September 30, 1981, grants totaling \$28,542,600 were awarded to fund research projects at 104 institutions.

Scientists with special expertise throughout the U.S. scientific community are involved in building the broad base of knowledge needed to meet the increasing challenges facing the U.S. food and agricultural system.



ANSON R. BERTRAND
Director
Science and Education

CONTENTS

	<u>Page</u>
THE GRANTS PROGRAMS.....	1
Competitive Research Grants Program....	2
Plant Biology.....	2
Biological nitrogen fixation..	2
Photosynthesis.....	7
Genetic mechanisms for crop improvement.....	13
Biological stress on plants...	21
Human Nutrition.....	29
Special Research Grants Program.....	34
Soybean research.....	34
Antidesertification research.....	36
Animal health.....	38
Aquaculture research.....	47
Energy and Alcohol Fuels Research Grants Program.....	50
Scientists Who Served On S&E Peer Panels For FY 1981.....	63

This publication was edited by Dr. Mason E. Miller, Communication Scientist, CSRS, USDA. The tables of grants were prepared by the Grants Administrative Management Office, Science and Education, USDA.

Copies available from the Publications Requests and Distribution Section, Information Staff, Science and Education, U.S. Department of Agriculture, Washington, D.C. 20250.

FOOD AND AGRICULTURE
COMPETITIVELY AWARDED
RESEARCH GRANTS

Fiscal Year 1981

THE GRANTS PROGRAM

The research grants programs of Science and Education that used the competitive process in the selection of grants during Fiscal Year 1981 are:

1. Competitive Research Grants Program to support basic research in the food and agricultural sciences;
2. Special Research Grants Program to support research deemed by the Congress and the Department of Agriculture to be of particular importance to the Nation; and
3. Energy and Alcohol Fuels Research Grants Program.

These sources of funding supplement and complement funding of Federal agricultural research and the basic State research institution formula funding by Congress to help maintain a viable, effective on-going State-Federal agricultural research capability for this country.

All the grant funds except part of the Energy and Alcohol Fuels Research Grants are administered through Cooperative State Research Service in S&E.

The Energy grants are administered by Agricultural Research Service's Southern Energy Center, Tifton, GA., and reviewed by the Energy Board.

Guidelines for grants to be awarded competitively are published annually in the Federal Register, usually near the end of each calendar year. The guidelines identify selected research areas, the amount of funding, and the requirements for the submission of proposals.

Single copies or annual or semiannual subscriptions of the Federal Register are available for a small charge from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

If you want further information on program aspects of these grants, contact:

Dr. Walter I. Thomas
Acting Administrator
Cooperative State Research Service
Science and Education
U. S. Department of Agriculture
Washington, D.C. 20250

If you want information on administrative aspects of these grants, contact:

Mr. Gene P. Spory
Grants Management Officer
Grants Administrative Management Office
Science and Education
U. S. Department of Agriculture
Suite 103, Rosslyn Commonwealth Building
1300 Wilson Boulevard
Arlington, Virginia 22209

All competitive funds for FY 1981 have been awarded. Any future competitive programs will be announced through the Federal Register.

COMPETITIVE RESEARCH GRANTS PROGRAM

The grants awarded in this program concentrate in the plant biology and human nutrition areas. These two areas were selected because many scientific groups consider them to offer exceptional opportunity for fundamental scientific discovery. Research in these areas, in the long run, should contribute to applied research and development vitally needed for solving important food and nutrition problems. There is a need for innovative approaches and enhanced levels of funding to find ways to increase food production and improve human nutrition.

The following tabulation lists the funds awarded in the various areas in FY 1981 under the Competitive Research Grants Program.

Plant biology		\$12,610,000
Biological nitrogen fixation	\$2,910,000	
Photosynthesis	\$2,910,000	
Genetic mechanisms for crop improvement	\$3,395,000	
Biological stress on plants	\$3,395,000	
Human requirements for nutrients		<u>\$ 2,910,000</u>
	TOTAL	\$15,520,000

This program is administered under the authority of Section 2(b) of P.L. 89-106, 7 U.S.C. 4501 as amended by Section 1414 of P.L. 95-113 and

and P.L. 92-224. It is open to qualified scientists in the United States. Scientists associated with the State agricultural experiment stations, all U.S. colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals may submit proposals.

Plant Biology

Grants were awarded in four areas of research in plant biology: Biological nitrogen fixation, photosynthesis, genetic mechanisms for crop improvement, and biological stress on plants. A brief description of each area of research follows with a listing of research grants made during FY 1981.

Biological Nitrogen Fixation

Grants in this area support research to find ways to naturally increase the nitrogen available to plants. Lack of nitrogen for plant growth is the most common limiting factor in crop agriculture. This research will contribute to understanding nitrogen-fixing mechanisms in both symbiotic and free-living organisms, as well as the fate of fixed nitrogen.

The objective of this research is to build a foundation of basic information concerning nitrogen fixation. This information should help us enhance the process in currently known systems and provide a base for developing new nitrogen fixing associations--by genetic transfer or other means--for crop species not now possessing such capability.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Arizona Tucson, Arizona 85721	⁹⁵ Mo NMR as a Probe of Molybdenum Centers	John H. Enemark	\$60,000	09/01/81	08/31/82
Univ. of California Berkeley, California 94720	Control of Denitrification in Bacterial Cells and Soil	Mary K. Firestone	\$48,000	07/01/81	06/30/83
Univ. of California Davis, California 95616	Physiological Genetics of Denitrification: A Route to Conserving Fixed Nitrogen	John L. Ingraham	\$56,000	07/01/81	06/30/82
Univ. of California Davis, California 95616	Symbiotic Cyanobacteria: Assimilation and Transfer of Fixed N ₂	John C. Meeks	\$45,000	08/08/79	08/31/82
Univ. of Calif-San Diego La Jolla, California 92093	Nitrogen Photoreactions on Desert Sands	Gerhard N. Schrauzer	\$90,000	08/01/81	07/31/83
Univ. of Connecticut Storrs, Connecticut 06268	Physiology of Nitrogen Fixation in Actinorhizal Root Nodules	David R. Benson	\$105,000	07/01/81	06/30/83
Univ. of Delaware Newark, Delaware 19711	Biochemical and Genetic Characterization of Algal Mutants Altered in Nitrogen Assimilation	Robert C. Hodson	\$100,000	08/01/81	07/31/83
Southern Illinois Univ. Carbondale, Illinois 62901	Nitrogen Fixation in <u>Rhodospirillaceae</u>	Michael T. Madigan	\$74,000	07/01/81	06/30/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Purdue Univ. West Lafayette, Indiana 47907	Three-Dimensional Structure of Nitrogenase	Leonard E. Mortenson	\$122,000	08/02/79	07/31/83
Northeastern Univ. Boston, Massachusetts 02115	The Role of Bacterial Motility and Chemotaxis in the Legume <u>-Rhizobium</u> Symbiosis	Kostia Bergman	\$110,000	07/12/79	06/30/83
Boston Univ. Boston, Massachusetts 02215	The Role of the Protonmotive Force in Nitrogen Fixation	Eva R. Kashket	\$90,000	09/05/78	08/31/83
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	Mechanism of Glutamate Synthase from Plants	William Orme-Johnson	\$90,000	08/01/81	07/31/83
Massachusetts Institute of Technology Cambridge, Massachusetts 02139	Biochemical and Genetic Approaches to the Characterization of <u>nif</u> Gene Products	William Orme-Johnson	\$85,000	08/01/81	07/31/82
Michigan State Univ. East Lansing, Michigan 48824	Pathway and Regulation of Ureide Biosynthesis in Soybeans	Karel R. Schubert	\$100,000	07/09/79	07/31/83
Michigan State Univ. East Lansing, Michigan 48824	Regulation of Heme Synthesis in <u>Rhizobium</u>	Kenneth D. Nadler	\$100,000	09/15/81	09/30/83
Univ. of Minnesota St. Paul, Minnesota 55108	Competitive Attributes of <u>Rhizobium japonicum</u> 123, a Successful Indigenous Strain	Edwin L. Schmidt	\$45,000	07/01/81	06/30/82

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Missouri Columbia, Missouri 65211	Ureide Synthesis and Utilization in Soybeans	Dale G. Blevins	\$130,000	07/15/81	07/31/83
Washington Univ. St. Louis, Missouri 63130	Natural ¹⁵ N Enrichment in Soybean Nodules in Relation to N ₂ Fixative Efficiency	Daniel H. Kohl	\$120,000	08/01/81	07/31/83
Univ. of Nebraska Lincoln, Nebraska 68583	Status of Leghemoglobin in Leguminous Nodules	Robert V. Klucas	\$100,000	07/15/81	07/31/83
North Carolina State Univ. Raleigh, North Carolina 27650	Genetics of Nitrogen Fixation in <u>Azotobacter</u> <u>vinelandii</u>	Paul E. Bishop	\$95,000	07/15/81	07/31/83
Ohio Agric. Research & Dev. Center Wooster, Ohio 44691	Inhibition of Legume Nodule Growth and Activity by Nitrate	John G. Streeter	\$95,000	08/01/81	07/31/83
Charles F. Kettering Fdn. Res. Lab 150 E. South College St. Yellow Springs, Ohio 45387	The Azolla-Anabaena Symbiosis: Development Morphology and Physiology	Gerald A. Peters	\$130,000	08/15/79	08/31/83
Charles F. Kettering Fdn. Res. Lab 150 E. South College St. Yellow Springs, Ohio 45387	Hemeprotein Oxidases, P ₄₅₀ and Nitrogen Fixation in Nodules and Cultured Rhizobia	Donald L. Keister	\$130,000	07/01/81	06/30/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
Charles F. Kettering Fdn. Res. Lab 150 E. South College St. Yellow Springs, Ohio 45387	A New Enzyme in the Nitrogen Metabolism of the Root-Nodule Bacteria of Legumes	Robert A. Darrow	\$110,000	08/01/81	07/31/83
Charles F. Kettering Fdn. Res. Lab 150 E. South College St. Yellow Springs, Ohio 45387	Chemical Probes for the Molybdenum Site of Nitrogenase	James W. McDonald	\$90,000	09/01/81	08/31/83
Univ. of Oklahoma Norman, Oklahoma 73019	Mechanism of Regulation of Nitrite Reductase Activity	Leonard Beevers	\$100,000	07/01/81	06/30/83
Oregon State Univ. Corvallis, Oregon 97331	Ecology of <u>Rhizobia</u> Nodulating Forage Legumes	Peter J. Bottomley	\$110,000	08/01/81	07/31/83
Univ. of Washington Seattle, Washington 98195	Nitrogen Fixation in Methane Oxidizing Bacteria	Mary L. O'Connor	\$90,000	08/01/81	07/31/83
Univ. of Wisconsin Madison, Wisconsin 53706	Cellular Specialization in Legume Root Nodules	Eldon H. Newcomb	\$130,000	07/01/81	06/30/83
Univ. of Wisconsin Madison, Wisconsin 53706	Non-genetic Regulation of Nitrogenase in Photosynthetic Bacteria	P. W. Ludden	\$110,000	08/01/81	07/31/83
Univ. of Wisconsin Madison, Wisconsin 53706	HD Formation by Nitrogenase	Robert H. Burris	\$50,000	07/15/81	07/31/83

TOTAL: \$ 2,910,000

Photosynthesis

Grants in this area focus on a better understanding of photosynthesis and associated carbon metabolism. Photosynthesis is the process whereby plants convert solar energy into chemical products that plants and animals use for growth and development. There are many indications that crop plant productivity can be raised by increasing photosynthetic efficiency.

The program's aim is to cover such areas as the mechanisms of energy capture and conversion, structure, synthesis, and turnover of the photosynthetic apparatus, CO₂ fixation, photorespiration, and dark respiration. Other areas included in this program are projects on the relation of plant development to photosynthesis, including development of photosynthetic competence, translocation and partitioning of photosynthetic products; and design of whole leaf and whole plant structures best suited for photosynthetic productivity. Another area set forth for proposals is that of the design of new methods of genetic and cellular manipulation to improve photosynthetic efficiency in plants--including studies of the chloroplast genome, of nuclear genes regulating photosynthesis, and analysis of regulatory steps controlling both nuclear and cytoplasmic genome expression and their interactions.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Arkansas Fayetteville, Arkansas 72701	Protein: Protein Interaction in Photosynthetic Nitrite and NADP Reduction	Danny J. Davis	\$33,000	08/28/79	08/31/82
Univ. of California Berkeley, California 94720	Photosynthetic Enzyme Regulation in C ₄ and CAM Plants	Bob B. Buchanan	\$104,000	08/13/79	08/31/83
Univ. of California Berkeley, California 94720	Structural Differentiation and Functional Organization in Higher Plant Chloroplasts	Anastasios Melis	\$50,000	09/01/81	08/31/83
Univ. of Miami Coral Gables, Florida 33124	Structural Studies of Chlorophyll-Protein Complexes	Roger E. Fenna	\$78,000	09/01/81	08/31/83
Univ. of Florida Gainesville, Florida 32611	Translocation of Photosynthates into Citrus Fruit Sinks	Karen E. Koch	\$65,000	09/01/81	08/31/84
Univ. of Idaho Moscow, Idaho 83843	Physiological Basis for Increased Rates of Photosynthesis in Potato Clones	Robert B. Dwelle	\$70,000	09/01/81	08/31/84
Univ. of Illinois Urbana, Illinois 61801	Physiological and Molecular Basis for Chilling-Impairment of Photosynthesis	Donald R. Ort	\$39,000	08/15/79	08/31/82
Univ. of Illinois Urbana, Illinois 61801	Effects of Water Stress on Photosynthetic CO ₂ Assimilation	Archie R. Portis	\$80,000	09/01/81	08/31/83
Univ. of Illinois Urbana, Illinois 61801	Herbicide Action and Selectivity in Photosynthetic Electron Transport	Colin A. Wraight	\$50,000	09/15/81	09/30/82

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Purdue Univ. West Lafayette, Indiana 47907	Chloroplast Membrane Bioenergetics - The Role of Phosphorylation	Richard A. Dilley	\$137,000	07/01/81	06/30/84
Purdue Univ. West Lafayette, Indiana 47907	The Partitioning of Carbon in Wheat	Thomas L. Housley	\$79,000	09/01/81	08/31/84
Louisiana State Univ. & A&M College Baton Rouge, Louisiana 70803	Environmental Effects on Photosynthesis and Leaf Anatomy in Developing Leaves	David J. Longstreth	\$72,000	08/15/81	08/31/84
Martin Marietta Corp. Martin Marietta Labs 1450 South Rolling Rd. Baltimore, Maryland 21227	Light-Driven Oxygen Reduction: Significance and Mechanism	Richard J. Radmer	\$142,000	07/01/81	08/31/83
Univ. of Maryland- Baltimore County Catonsville, Maryland 21228	Regulation of O ₂ Exchange in Higher Plants	Thomas V. Marsho	\$82,000	09/01/81	08/31/83
Michigan State Univ. East Lansing, Michigan 48824	Charge Separation and Stabilization in Chloroplast Photosystem II	Gerald T. Babcock	\$56,000	08/01/81	07/31/82
Michigan State Univ. East Lansing, Michigan 48824	Mechanism of ATP Synthesis in Chloroplasts	Norman E. Good	\$53,000	09/01/81	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Missouri Columbia, Missouri 65211	Using Wild Relatives of Tall Fescue for Improving Photosynthesis in Plants	Douglas D. Randall	\$198,000	08/31/79	08/30/84
Washington Univ. St. Louis, Missouri 63130	Ultrafast Spectroscopic Studies of Photosynthetic Electron Transfer	Dewey Holten	\$70,000	09/01/81	08/31/83
Rutgers, The State Univ. New Brunswick, New Jersey 08903	Synthesis, Processing, and Assembly of the Chloroplast Coupling Factor (CF)	Carl A. Price	\$96,000	09/01/81	08/31/83
Princeton Univ. Princeton, New Jersey 08544	Characterization of the O ₂ Evolving Enzyme in Photosynthetic Membranes	G. Charles Dismukes	\$72,000	09/01/81	08/31/83
Cornell Univ. Ithaca, New York 14853	Photosynthetic Membrane Growth	Andre T. Jagendorf	\$110,000	08/13/79	08/31/83
Cornell Univ. Ithaca, New York 14853	Role of Membrane Transport Systems in the Partitioning of Photosynthate	Roger M. Spanswick	\$58,000	09/01/81	08/31/82
Cornell Univ. Ithaca, New York 14853	Physiological Control of Photosynthate Partitioning in Beans	Pamela M. Ludford	\$36,000	08/02/79	08/31/82
Cornell Univ. Ithaca, New York 14853	Photosynthate Partitioning in Storage Tissues of Corn (<u>Zea mays</u> L.)	Timothy L. Setter	\$68,000	09/15/81	09/30/84
CUNY Res. Fdtn. on behalf of Hunter College New York, New York 10021	Isolation of the Water- Splitting Apparatus of Photosynthesis	Richard G. Piccioni	\$25,000	09/15/80	09/30/82

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Rockefeller Univ. 1230 York Ave. New York, New York 10021	Regulation of PEP Carboxylase Gene Expression	Nam-Hai Chua	\$50,000	09/01/81	08/31/82
The Rockefeller Univ. New York, New York 10021	Structure and Function of the Photosynthetic Unit	Arthur C. Ley	\$110,000	09/01/81	08/31/83
Rensselaer Polytechnic Institute Troy, New York 12181	Synthesis and Assembly of Chloroplast Protein	Harry Roy	\$34,000	09/01/81	08/31/82
Brookhaven National Lab U.S. Dept. of Energy Upton, New York 11973	Photosynthetic Mechanisms of Nitrogen Reduction in Heterocysts of Cyanobacteria	Geoffrey Hind	\$82,000	08/31/79	08/31/83
Western Carolina Univ. Cullowhee, North Carolina 28723	Mechanisms for Transfer of Phospholipids into Photosynthetic Membranes	Roger H. Lumb	\$66,000	09/01/81	08/31/83
Brown Univ. Providence, Rhode Island 02912	Biosynthesis of Chlorophyll <u>b</u>	Samuel I. Beale	\$55,000	07/15/81	07/31/83
Brown Univ. Providence, Rhode Island 02912	Membrane Architecture in Relation to Energy Distribution in Photosynthesis	John Biggins	\$78,000	08/01/81	07/31/83
Univ. of South Carolina Columbia, South Carolina 29208	Metabolic Control in Peroxisomes and Mitochondria in Photorespiration	Anthony H.C. Huang	\$95,000	08/20/79	07/31/83
Univ. of Vermont Burlington, Vermont 05401	Kinetic Analysis of RuBP Carboxylase/Oxygenase: A Survey for Mutant Enzymes	Samuel S. Kent	\$90,000	09/01/81	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Washington State Univ. Pullman, Washington 99164	Sucrose Assimilation in the Developing Wheat Endosperm	Peggy Chevalier	\$34,000	08/08/79	07/31/82
Univ. of Wisconsin Madison, Wisconsin 53706	Studies on the Chloroplast Envelope	Kenneth G. Keegstra	\$130,000	08/13/79	08/31/83
Univ. of Wisconsin Madison, Wisconsin 53706	Mechanism of Action of Phosphoenolpyruvate Carboxylase	Marion O'Leary	\$110,000	08/13/79	08/31/83
The Medical College of Wisconsin Milwaukee, Wisconsin 53226	Mechanism of Activation of Ribulose Bisphosphate Carboxylase	Henry M. Miziorko	\$53,000	09/01/81	08/31/82

TOTAL: \$ 2,910,000

Genetic Mechanisms for Crop Improvement

Grants in this area are to encourage innovative or unique genetic approaches for the development of genetically superior varieties of agricultural crops. The desire is to obtain novel genetic combinations or gene modifications difficult or impossible to achieve using conventional plant-breeding techniques. Research areas are cell culture studies; development of cellular and molecular methods for identifying plant characteristics or genes that are significant targets for genetic manipulation; development of methods for producing, selecting, and transferring desired genetic traits; acquisition of basic information on nuclear and organelle plant gene expression and diversity at the molecular, cellular, or developmental level; and basic genetic studies on maintenance, alteration, and use of unadapted and wild germplasm.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Arizona Tucson, Arizona 85721	Biochemistry and Genetics of Chloroplast Ribosomes	Don P. Bourque	\$60,000	08/01/81	07/31/83
Univ. of California Berkeley, California 94720	Characterization of Auxin Variants from Carrot Culture	Zinmay Renee Sung	\$60,000	08/31/79	08/31/83
Univ. of California Davis, California 95616	Transfer of Quantitative Characters: Salt Tolerance from <u>Elytrigia (Agropyron)</u> to <u>Triticum</u>	Jan Dvorak	\$40,000	09/01/81	08/31/82
Univ. of California Davis, California 95616	Gene Vehicle Analyses for Genetic Modification of Higher Plants	Clarence I. Kado	\$40,000	08/15/81	08/31/82
Univ. of California Davis, California 95616	Genetics of DNA Sequence Organization Pattern Alleles in <u>Avena</u>	Robert W. Allard	\$75,000	09/01/81	08/31/83
Univ. of Calf.-San Diego La Jolla, California 92093	Use of Plant Viruses to Introduce DNA into Plants	Stephen H. Howell	\$50,000	09/01/81	08/31/82
Stanford Univ. Stanford, California 94305	Repeated DNA Sequences of Maize: Variability, Transmission and Significance	Virginia Walbot	\$80,000	09/01/81	08/31/83
Colorado State Univ. Fort Collins, Colorado 80523	Production and Evaluation of Aneuhaploid Barley by Remote Crossing and Embryo Culture	Takumi Tsuchiya	\$75,000	08/01/81	07/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Florida Gainesville, Florida 32611	T-DNA: A Model for Gene Expression in Higher Plants	William B. Gurley	\$75,000	08/01/81	07/31/83
Univ. of Florida Gainesville, Florida 32611	Plasmid-like DNAs Associated with Cytoplasmic Male Sterility in Sorghum	Daryl R. Pring	\$50,000	09/01/81	08/31/82
Florida State Univ. Tallahassee, Florida 32306	Development of a Genetic Manipulation System for Cotton	Margaret Y. Menzel	\$40,000	09/15/81	09/30/82
Univ. of Georgia Research Fdn., Inc. Athens, Georgia 30602	Gene Expression in Suspension Cultures and Seedling Tissues of Alfalfa and Soybean	Joe L. Key	\$75,000	09/01/81	08/31/83
Univ. of Georgia Research Fdn., Inc. Athens, Georgia 30602	Characterization of Genetic Control Sequences for Genetic Engineering in Plants	Richard B. Meagher	\$60,000	09/05/78	08/31/83
NCR, USDA-S&E-ARS 2000 W. Pioneer Parkway Peoria, Illinois 61614	Mechanism of Genetic Regulation of Shrunken Endosperm Mutants in Barley	David M. Peterson	\$80,000	07/01/81	06/30/84
NCR, USDA-S&E-ARS 2000 W. Pioneer Parkway Peoria, Illinois 61614	Synthesis of New Tetraploid Red Clover Germplasm Using 2n Gametes	Richard R. Smith	\$65,000	07/01/81	06/30/84
NCR, USDA-S&E-ARS 2000 W. Pioneer Parkway Peoria, Illinois 61615	The Use of Meiotic Mutants for the Exploitation of <u>Solanum</u> Germplasm	Robert E. Hanneman	\$90,000	09/01/81	08/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
NCR, USDA-S&E-ARS 2000 W. Pioneer Parkway Peoria, Illinois 61615	Nuclear Genes Controlling Chloroplast Development in Maize	Edward H. Coe	\$100,000	08/01/81	07/31/84
Univ. of Illinois Urbana, Illinois 61801	Develop Maize Genotypes with Altered Enzyme Systems and Products for Efficient Nitrogen Metabolism	Richard H. Hageman	\$60,000	08/01/81	07/31/83
Univ. of Illinois Urbana, Illinois 61801	Transfer of Genetic Material and Regeneration of Altered Plants	Jack M. Widholm	\$60,000	09/01/81	08/31/83
Indiana Univ. Fdn. Bloomington, Indiana 47402	Analysis of the Genetic Arrangement of Zea Mays MtDNA	John H. Sinclair	\$100,000	09/01/81	08/31/83
Purdue Research Fdn. West Lafayette, Indiana 47907	Regulation of Tuber Protein Synthesis in the Potato	William D. Park	\$90,000	07/01/81	06/30/83
Iowa State Univ. of Science & Technology Ames, Iowa 50011	The Coordinate Regulation of Unlinked, Functionally Related, Genes in Maize	Hugo K. Dooner	\$100,000	08/01/81	07/31/84
Iowa State Univ. of Science & Technology Ames, Iowa 50011	Aneuploids and Polyploids from <u>ms₁</u> Soybeans: Their Use in Crop Improvement	Reid G. Palmer	\$40,000	09/01/81	08/31/83
Kansas State Univ. Manhattan, Kansas 66506	Tissue Culture as a Method of Alien Gene Transfer in Wheat (<u>Triticum aestivum</u> L.)	Rollin G. Sears	\$63,100	09/01/81	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Kentucky Research Fdn. Lexington, Kentucky 40546	Wide Hybridization and Gene Transfer in <u>Nicotiana</u> and <u>Trifolium</u>	Glenn B. Collins	\$50,000	07/01/81	06/30/82
NER, ARS, S&E, USDA Rm 333, Bldg 003 BARC-West Beltsville, Maryland 20705	Plant Cell Transformation Using Liposome-delivered Chromosomes and DNA	Benjamin F. Matthews	\$50,000	09/01/81	08/31/83
Wayne State Univ. Detroit, Michigan 48202	A Novel Vehicle for Introducing Genetic Information into Plants	Albert Siegel	\$101,800	09/01/81	08/31/83
Michigan State Univ. East Lansing, Michigan 48824	Genetic Resistance to Virus Disease in Somatic Cells of Crop Plant Species	Harry H. Murakishi	\$40,000	08/31/79	08/31/83
Univ. of Minnesota St. Paul, Minnesota 55104	The Potato Protein Phenotype: A Model for Its Genetic Expression	Sharon L. Desborough	\$60,000	08/01/81	07/31/83
Univ. of Minnesota St. Paul, Minnesota 55104	Phaseolus: A Model for Simultaneous Use and Preservation of Crop Plant Germplasm	Peter D. Ascher	\$60,000	09/01/81	08/31/84
Univ. of Missouri Columbia, Missouri 65211	Ti Plasmids as Plant Genetic Engineering Vectors	Donald J. Merlo	\$87,400	08/31/79	08/31/83
Univ. of Missouri Columbia, Missouri 65211	Selection, Characterization, and Preservation of Mutants in Corn	M. G. Neuffer	\$55,000	09/01/81	08/31/84

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Missouri Columbia, Missouri 65211	Electron Microscopy of Chromosome Pairing in Wheat: A Study of the Gene Ph	Henry A. McQuade	\$60,000	09/01/81	08/31/83
Washington Univ. St. Louis, Missouri 63130	Role of Target Gene Promoter Sequences in Genetic Engineering	Roger N. Beachy	\$40,000	08/01/81	07/31/83
Washington Univ. St. Louis, Missouri 63130	Liposome-mediated Delivery of Ti Plasmid DNA and Mini-Ti Plasmids into Plant Protoplasts	Mary-Dell Chilton	\$90,000	08/15/81	08/31/83
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68583	Allozyme Patterns and Population Improvement in Corn and Sorghum	Charles O. Gardner	\$40,000	09/01/81	08/31/83
Cornell Univ. Ithaca, New York 14853	Introgression of Wild Diploid and Tetraploid <u>Avena</u> Species via Octoploids	Mark E. Sorrells	\$61,600	07/01/81	06/30/84
Cornell Univ. Ithaca, New York 14853	New Fungal Toxins for <u>in vitro</u> and Field Selection of Disease-Resistant Corn	Elizabeth D. Earle	\$40,000	08/01/81	07/31/83
Rockefeller Univ. New York, New York 10021	Characterization of Plant Genes Encoding Photosynthetic Membrane Proteins	Anthony R. Cashmore	\$80,000	08/01/81	07/31/83
North Carolina State Univ. Raleigh, North Carolina 27650	Structural Determinants of Differential Gene Expression in Maize	John C. Sorenson	\$54,100	09/15/81	09/30/82

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
North Carolina State Univ. Raleigh, North Carolina 27650	Biosystematics and Utilization of <u>Arachis</u> Species to Improve Cultivated Peanuts	Harold T. Stalker	\$50,000	08/31/79	08/31/83
North Carolina State Univ. Raleigh, North Carolina 27650	Genetic Relationships Between Physiological Traits and Drought Tolerance	Thomas E. Carter	\$40,000	09/01/81	08/31/83
Agric. Expt. Station North Dakota State Univ. Fargo, North Dakota 58105	Genetic Analysis of Male-Fertility Restoring Genes in <u>Triticum aestivum</u> L.	Shivcharan S. Maan	\$75,000	07/01/81	06/30/84
Oregon State Univ. Corvallis, Oregon 97331	Assessing Genetic Efficiency of Douglas-fir Seed Orchards	Wesley T. Adams	\$80,000	07/01/81	06/30/84
Inst. for Cancer Res. 7701 Burholme Ave. Phila., Pennsylvania 19111	Definition of the mRNA Attachment Reaction in Protein Synthesis	Abraham Marcus	\$90,000	09/01/81	08/31/83
Pennsylvania State Univ. Univ. Park, Pennsylvania 16802	Development of Genetic Models for Autotetraploids Using the Ozone Response in Potatoes	Eva J. Pell	\$40,000	08/01/81	07/31/83
Pennsylvania State Univ. Univ. Park, Pennsylvania 16802	Manipulation of Cytoplasmic Factors of Solanum	Paul Grun	\$29,600	09/01/81	12/31/82

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Texas A&M Res. Fdn. College Station, Texas 77843	Genetic Analyses of Wheat Relatives Using Wheat-alien Chromosome Addition Lines	Gary E. Hart	\$80,000	07/01/81	06/30/83
Texas A&M Res. Fdn. College Station, Texas 77843	Genetic and Biochemical Regulation Seed Dormancy in <u>Zea mays</u>	James D. Smith	\$60,000	08/31/79	08/31/83
Univ. of Virginia Char'tsville, Virginia 22903	Fate of Plastid Genomes Following Plant Protoplast Fusion	Maureen R. Hanson	\$10,000	08/01/81	07/31/83
Washington State Univ. Pullman, Washington 99164	Expression of T-DNA Sequences in Crown Gall Tumors	Michael F. Thomashow	\$75,000	08/01/81	07/31/83
Univ. of Wisconsin Madison, Wisconsin 53706	Systems for Polygenic Control of a Metric Trait, Phaseolin Seed Protein	Fredrick A. Bliss	\$42,400	09/15/81	09/30/82
Univ. of Wisconsin Madison, Wisconsin 53706	Genetic Analysis of Alfalfa Variants Regenerated from Cell Cultures	E. T. Bingham	\$40,000	07/01/81	06/30/82
Univ. of Wisconsin Madison, Wisconsin 53706	Phytochrome: Sequence Determination Using Recombinant DNA Methodology	Peter H. Quail	\$60,000	09/01/81	08/31/83
Univ. of Wisconsin Madison, Wisconsin 53706	Improving the Nutritional Quality of Barley Through Tissue and Cell Culture	Marshall A. Brinkman	\$25,000	08/31/79	08/31/82

TOTAL: \$ 3,395,000

Biological Stress on Plants

Research grants in this area support studies on stresses on plants arising from their interactions with other plants or with other biological agents such as weeds, insects, nematodes, fungi, bacteria, viruses, and mycoplasma-like organisms. The ultimate goal is to reduce losses in plant productivity from damage caused by biologically generated stresses.

Emphasis in this area is on studies that will enhance understanding of how stressful interactions are established between plants and other biological agents; how such interactions are influenced by environmental and other factors inherent to the interacting organisms; how the interactions reduce plant productivity and usefulness to man; how plants react to stress generated by such interactions; and how damage from such interactions may be reduced or eliminated.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of California Berkeley, California 94720	Genetic Analysis of Pathogenicity, Toxigenicity, and Toxin Immunity in <u>Pseudomonas phaseolicola</u>	Nickolas J. Panopoulos	\$85,000	07/09/79	06/30/83
Univ. of California Berkeley, California 94720	Bacterial Ice Nucleation Active Proteins in Relation to Plant Frost Injury	Steven E. Lindow	\$80,000	07/12/79	09/30/83
Univ. of California Davis, California 95616	Host-Parasite Interactions, Population Performance and Gene-Pool Management	Robert W. Allard	\$79,000	05/31/79	06/30/83
Univ. of California Davis, California 95616	Mechanisms Controlling Expression of Virulence in <u>Pseudomonas savastanoi</u>	Tsune Kosuge	\$39,000	07/01/81	06/30/82
Univ. of California Davis, California 95616	Defining and Mapping the Genes of Cauliflower Mosaic Virus	Robert J. Shepherd	\$38,000	08/01/81	07/31/82
Univ. of California Davis, California 95616	Physiological Studies of a Cell Wall Lectin	Marilyn E. Etzler	\$72,000	07/09/79	06/30/83
Univ. of California Los Angeles, California 90024	Biochemical Genetics of Bacterial Plant Pathogens	Gary L. Wilcox	\$40,000	09/15/81	09/30/82
WR, ARS, S&E, USDA 1333 Broadway, Suite 400 Oakland, California 94612	Microbiological-Plant Interactions Limiting to Parasitism of Wheat Roots by <u>Gaeumannomyces Graminis</u>	R. James Cook	\$60,000	09/15/81	09/30/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of California Riverside, California 92521	Plant Growth Under Nematode Stress: Explanatory and Predictive Assessment	Howard Ferris	\$75,000	09/15/81	09/30/83
Colorado State Univ. Fort Collins, Colorado 80523	Biological Control of Plant Diseases Using Pathogen Suppressive Soils	Ralph Baker	\$60,000	05/31/79	06/30/83
Univ. of Georgia Research Fdn, Inc. Athens, Georgia 30602	Elimination of Denitrification as a Plant Stress Factor	Harry A. Mills	\$21,000	08/01/81	07/31/82
Univ. of Idaho Moscow, Idaho 83843	Predicting Infection Levels of Grasshoppers by <u>Entomophthora grylli</u> on Rangeland	Leslie P. Kish	\$75,000	08/01/81	07/31/83
NCR, ARS, S&E, USDA 2000 W. Pioneer Parkway Peoria, Illinois 61614	Formation of Virus-Induced Mosaics and Mutation in Cereals and Maize	Myron K. Brakke	\$70,000	09/15/81	03/31/84
Univ. of Illinois Urbana, Illinois 61801	Kairomones in Corn and Cucurbits in Monitoring and Controlling Corn Rootworms	Robert L. Metcalf	\$27,000	09/15/81	09/30/82
Purdue Research Fdn. West Lafayette, Indiana 47907	Function and Interaction of Barley Stripe Mosaic Virus RNAs in Infected Barley	Andrew O. Jackson	\$80,000	05/31/79	06/30/83
Purdue Research Fdn. West Lafayette, Indiana 47907	Assembly and Structure of Spherical Plant Viruses	Michael G. Rossmann	\$70,000	09/15/81	09/30/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Iowa State Univ. of Science & Technology Ames, Iowa 50011	Synthesis of Race T Toxin and Analogs	George A. Kraus	\$78,000	08/01/81	07/31/83
Univ. of Iowa Iowa City, Iowa 52242	The Chemical Basis of Plant Resistance to Defoliation by Leafcutter Ants	David F. Wiemer	\$80,000	06/19/79	07/31/83
Kansas State Univ. Manhattan, Kansas 66506	Inheritance and Expression of Bacterial Determinants of Soft-rot Diseases	Arun K. Chatterjee	\$39,000	08/01/81	07/31/84
Univ. of Kentucky Lexington, Kentucky 40506	Regulation of Viral Gene Expression in Plant Virus Infections	John G. Shaw	\$50,000	03/01/81	02/28/83
Univ. of Kentucky Research Fdn. Lexington, Kentucky 40506	Plant Antibiotic Tolerance as an Explanation of Fungal Pathogenicity	David A. Smith	\$70,000	07/15/80	09/30/83
Univ. of Kentucky Res. Fdn. Lexington, Kentucky 40506	Insecticidal Non-Protein Amino Acid Biochemistry	Douglas L. Dahlman	\$60,000	08/01/81	07/31/83
Univ. of Kentucky Research Fdn. Lexington, Kentucky 40506	Mite Behavior on <u>Lycopersicon</u> Leaves: Role of Trichomes and Certain Leaf Oils	John C. Snyder	\$70,000	09/01/81	08/31/83
NER, ARS, S&E, USDA Beltsville, Maryland 20705	Mechanisms of Plant Viroid Replication and Viroid-Host Interaction	Robert A. Owens	\$70,000	09/15/81	09/30/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Maryland College Park, Maryland 20742	Interaction of Plant Chemicals, Insect Herbivores and Insect Parasites	Pedro Barbosa	\$65,000	09/15/81	09/30/83
Univ. of Massachusetts Amherst, Massachusetts 01003	Potato Response to Defoliation Stress: Colorado Potato Beetle A Defoliator Model	David N. Ferro	\$70,000	08/01/81	07/31/83
Michigan State Univ. East Lansing, Michigan 48824	Role of Graminin A in Pathogenesis of Winter Wheat	Dennis W. Fulbright	\$25,000	08/01/81	07/31/83
Michigan State Univ. East Lansing, Michigan 48824	Microbial Influences on Host Finding and Colonization by the Onion Fly	James R. Miller	\$60,000	06/27/79	06/30/83
Univ. of Minnesota St. Paul, Minnesota 55108	Measurement of Diversity and Heterozygosity in Rust Fungus Populations	James V. Groth	\$75,000	08/01/81	07/31/83
SR, ARS, S&E, USDA Southern Weed Science Lab Stoneville, Mississippi 38776	Biocontrol of the Weeds Velvetleaf and Prickly Sida with a Fungal Pathogen	H. Lynn Walker	\$75,000	09/15/81	09/30/83
Univ. of Nebraska Lincoln, Nebraska 68588	Bacteriocins and Phage Ghosts; Use in Disease Control of Plant Pathogenic Bacteria	Anne K. Vidaver	\$70,000	06/19/79	06/30/83
Univ. of Nebraska Lincoln, Nebraska 68588	Intercellular Communication in Plants: Characterization of the Stress-induced Signal	Eric Davies	\$70,000	09/01/81	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Res. Fdn. of SUNY P.O. Box 9 Albany, New York 12201	Toxic Interrelations of Polyamines and Ethylene in Virus-infected Plants	Seymour S. Cohen	\$80,000	09/01/81	08/31/83
Boyce Thompson Inst. for Plant Research Ithaca, New York 14853	An Enzyme Storage Complex for DNA Synthesis in Uredospores of the Bean Rust Fungus	Richard C. Staples	\$32,000	09/01/81	08/31/82
Cornell Univ. Ithaca, New York 14853	Cell Wall Appositions and Plant Disease Resistance	James R. Aist	\$70,000	06/27/79	06/30/83
Boyce Thompson Inst. for Plant Research Ithaca, New York 14853	Characterization of the Toxin Produced by the Causal Organism of the Eyespot Disease of Sugarcane	Vladimir Macko	\$57,000	09/01/81	08/31/83
Cornell Univ. Ithaca, New York 14853	Biological Control of <u>Pythium</u> Incited Diseases of Table Beets with <u>Laetisaria</u> <u>arvalis</u>	Harvey C. Hoch	\$70,000	09/15/81	09/30/83
Cornell Univ. Ithaca, New York 14853	Interactions of Plant Viruses with Their Hosts	Milton Zaitlin	\$60,000	09/01/81	08/31/83
Cornell Univ. Ithaca, New York 14853	Biochemical Basis for Cytoplasmic Specificity in Southern Corn Leaf Blight	Peter Gregory	\$70,000	06/19/79	08/31/83
Univ. of North Carolina Chapel Hill North Carolina 27514	Interactions of Plant Tissue Culture Cells with <u>Agrobacterium</u> and Other Pathogenic Bacteria	Ann G. Matthyse	\$75,000	09/01/81	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
North Carolina State Univ. Raleigh, North Carolina 27650	Biochemical Basis for Cyst-Nematode Suppression of Nitrogen Fixation in Soybean	Jeng-sheng Huang	\$80,000	07/01/81	06/30/83
North Carolina State Univ. Raleigh, North Carolina 27650	Phytochemical Basis for Insect Resistance in Tomato: Toward a Quantitative Model	Jon Bordner	\$43,000	08/01/81	07/31/83
North Carolina State Univ. Raleigh, North Carolina 27650	Allelopathic Substances in Ecosystems: The Role of the Soil Environment	Udo Blum	\$80,000	08/01/81	07/31/83
North Carolina State Univ. Raleigh, North Carolina 27650	Host Suitability and Spread of Aphid-Borne Plant Viruses	James W. Moyer	\$70,000	09/01/81	08/31/83
North Carolina State Univ. Raleigh, North Carolina 27650	Expression of a Plant Viral Genome	William G. Dougherty	\$40,000	09/01/81	08/31/84
Ohio Agric. Res. & Dev. Center Wooster, Ohio 44691	Evolution of Leafhoppers and Stunting Pathogens with Maize and its Ancestors	Lowell R. Nault	\$42,000	07/01/81	06/30/82
Ohio Agric. Res. & Dev. Center Wooster, Ohio 44691	Characterization of Plasmids and Virulence Genes in <u>Erwinia stewartii</u>	David L. Coplin	\$75,000	08/01/81	07/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Oregon State Univ. Corvallis, Oregon 97331	Physiological Interactions Between Twospotted Spider Mite and Host Plant	Ralph E. Berry	\$80,000	05/31/79	06/30/83
Univ. of Tennessee Knoxville, Tennessee 37916	Metabolism and Interactions of Pulegone in Fall and Southern Armyworm Larvae	Lena B. Brattsten	\$53,000	08/01/81	07/31/82
Texas A&M Res. Fdn. College Station, Texas 77843	Allomonas Involved in the Parasite-Host Plant Interaction: A Model System	S. Bradleigh Vinson	\$46,000	08/01/81	07/31/82
Texas A&M Res. Fdn. College Station, Texas 77843	Mechanism of Stress Ethylene Induction in Cotton by the Fleahopper	Page W. Morgan	\$46,000	09/01/81	08/31/82
Utah State Univ. Logan, Utah 84322	Specificity of Plant-Microbe Interactions	Anne J. Anderson	\$50,000	03/01/81	02/28/83
Washington State Univ. Pullman, Washington 99164	Wound-Regulated Synthesis and Accumulation of Proteinase Inhibitors in Plants	Clarence A. Ryan	\$48,000	07/01/81	06/30/82
Univ. of Wisconsin Madison, Wisconsin 53706	Epiphytic Bacteria as Inoculum for Foliar Diseases: A Threshold Concept	Douglas I. Rouse	\$90,000	07/15/81	07/31/83
Univ. of Wisconsin Madison, Wisconsin 53706	Foliar Biological and Integrated Control of the Apple Scab Disease	John H. Andrews	\$40,000	08/01/81	11/30/82

TOTAL: \$ 3,395,000

Human Nutrition

The emphasis in this program is on determining human nutrient requirements. Support is not provided for clinical research or for demonstration or action projects.

Research in human nutrition contributes to improving human nutritional status by increasing our understanding of requirements for nutrients in relation to different patterns of food intake. Findings help fill the gaps of our knowledge related to nutrient requirements, bioavailability, the inter-relationships of nutrients, and the nutritional value of foods consumed in the United States as they relate to these requirements. Special attention in this program is given to the study of trace constituents of foods and their effect on human health.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of California Davis, California 95616	Bioavailability of Trace Element Supplements in Infant Formulas	Lucille S. Hurley	\$220,000	09/15/81	09/30/83
Univ. of California Los Angeles, California 90024	Methionine, Choline, and Other Nutrient Requirements for Methylation	Marian E. Swendseid	\$210,000	09/01/81	08/31/84
Colorado State Univ. Fort Collins, Colorado 80523	Effects of Protein and Energy on Protein Synthesis During Lactation	Gustav R. Jansen	\$195,000	09/01/81	08/31/84
Univ. of Connecticut Storrs, Connecticut 06268	Insulin as a Mediator of Macronutrient-induced Hypercalciuria	Lindsay H. Allen	\$125,000	09/01/81	08/31/84
Univ. of Florida Gainesville, Florida 32611	Bioavailability of Folacin in Foods	Jesse F. Gregory	\$100,000	09/15/81	09/30/83
Univ. of Illinois Urbana, Illinois 61801	Iron Status and the Immune Response	Adria R. Sherman	\$85,000	09/15/81	09/30/84
Univ. of Illinois Urbana, Illinois 61801	Digestion of Plant Cell Fragments by Human Colonic Bacteria	Abigail A. Salyers	\$130,000	09/01/81	08/31/84
Univ. of Illinois Urbana, Illinois 61801	Essential Fatty Acids and the Immune Response	Patricia V. Johnston	\$95,000	09/01/81	08/31/83

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Fort Wayne State Hospital & Training Center 4900 St. Joe Road Fort Wayne, Indiana 46815	Use of Stable Isotopes to Improve Assessment of Vitamin B ₆ Requirements in Man	Stephen P. Coburn	\$75,000	09/15/81	09/30/83
Iowa State Univ. of Science & Technology Ames, Iowa 50011	A Steady State Approach to Human Vitamin A Status	James A. Olson	\$200,000	09/15/81	09/30/84
Univ. of Iowa Iowa City, Iowa 52242	The Chemistry of Dietary Chromium	Howard M. Goff	\$105,000	08/08/79	07/31/83
Louisiana State Univ. & A&M College Baton Rouge, Louisiana 70803	The Effects of Dietary Trans Linoleate on Prostaglandin Production by Platelets	Daniel H. Hwang	\$18,000	08/15/79	08/31/82
Johns Hopkins Univ. Baltimore, Maryland 21218	Radiometric Microbiologic Assay of B-Vitamins in Food: A New Approach	Tomas R. Guilarte	\$210,000	07/01/81	06/30/84
Univ. of Maryland College Park, Maryland 20742	Zinc, Selenium and Chromium Nutrition in Term and Pre-Term Infants	Glen E. Gordon	\$35,000	09/15/80	09/30/82
Boston Univ. Boston, Massachusetts 02215	Vitamin E and Natural Immune Regulation	Laurence M. Corwin	\$140,000	09/01/81	08/31/84
Massachusetts Inst. of Technology Cambridge, Massachusetts 02139	Biochemical Reasons for the Requirement of Vitamin A in the Mammalian Organism	George Wolf	\$80,000	09/01/81	08/31/82

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Massachusetts Inst. of Technology Cambridge, Massachusetts 02139	Intrinsic Labeling of Foods with Stable Isotopes for Use with Human Subjects	Morteza Janghorbani	\$109,500	09/01/81	08/31/82
Massachusetts Inst. of Technology Cambridge, Massachusetts 02139	Human Amino Acid Metabolism in Relation to Dietary Requirements	Vernon R. Young	\$80,000	09/15/81	09/30/82
Michigan State Univ. East Lansing, Michigan 48824	Metabolisms and Function of Retinoic Acid in the Small Intestine	Maija H. Zile	\$110,000	07/15/81	07/31/83
Michigan State Univ. East Lansing, Michigan 48824	Factors Affecting Copper Balance and Status in the Elderly	Wanda L. Chenoweth	\$60,000	09/15/81	09/30/83
Kirksville College of Osteopathic Medicine P.O. Box 949 Kirksville, Missouri 63501	The Antilipolytic Effect of Dietary Saturated Fats	Atif B. Awad	\$111,500	08/01/81	07/31/84
Univ. of Rochester Rochester, New York 14642	Effects of Carbohydrate Ingestion on Metabolic Rates of Humans	Robert G. Campbell	\$21,000	08/01/80	08/31/82
North Carolina State Univ. Raleigh, North Carolina 27650	Biological Interactions Between Dietary Iron and Other Elements	Charles H. Hill	\$75,000	08/01/81	07/31/84
Oklahoma Medical Res. Fdn. Oklahoma City, Oklahoma 73104	Dietary Requirements for Linoleic Acid and Antioxidant	Mary P. Carpenter	\$70,000	08/01/81	07/31/82

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN REQUIREMENTS FOR NUTRIENTS

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Pennsylvania State Univ. Univ. Park, Pennsylvania 16802	Dietary Requirements and Metabolism of Vitamin A Studied by Compartmental Analysis	Michael H. Green	\$100,000	09/01/81	08/31/83
Agric. Expt. Station Univ. of Tennessee Knoxville, Tennessee 37916	Availability of Orally Administered Carnitine	Dileep S. Sachan	\$50,000	09/01/81	08/31/83
Texas Tech Univ. Lubbock, Texas 79409	Influence of Chemical Form on the Selenium RDA for Humans	Shiang P. Yang	\$40,000	09/01/81	08/31/82
Univ. of Wisconsin Madison, Wisconsin 53706	Effect of Dietary Alterations on True Absorption and Endogenous Losses of Zinc	Janet L. Greger	\$60,000	03/01/81	02/29/84
			TOTAL: \$ 2,910,000		

SPECIAL RESEARCH GRANTS PROGRAM

The objective of this grant program is to carry out research to facilitate or expand promising breakthroughs in areas of food and agricultural sciences of importance to the Nation. Five major areas of research were funded under this program during Fiscal Year 1981:

Aquaculture Research	\$ 485,000
Antidesertification research	970,000
Soybean research	485,000
Animal health research	4,800,000
Energy research	<u>2,328,000</u>
TOTAL	<u>\$9,068,000</u>

This program is administered under the authority of Section 2(c) (1) of P.L. 89-106, as amended by Section 1414 of P.L. 95-113. Eligible institutions include land-grant colleges and universities, State agricultural experiment stations, and all colleges and universities having demonstrable capacity in food and agricultural research.

A brief description of the first four areas of research in the Special Research Grants program follows with a listing of research grants made in each area for 1981. Special Research Grants made for energy research are reported under "Energy and Alcohol Fuels Research Grants Program."

The objective of this research is to increase soybean production and conserve natural resources. Two areas of research are funded under this topic: (1) Soybean production research to increase yields, enhance production efficiency, and conserve natural resources; and (2) research on soybean genetic mechanisms that contribute to yield or tolerance to biotic and abiotic stress.

Soybean acreage in the U.S. is exceeded only by corn. Farmers receive more dollars from soybean sales than any other crop, and the export of soybeans contributes more to the U.S. balance of trade than any other agricultural commodity. Edible soybean oil provides the raw material for a diversity of food and industrial uses. The high protein meal provides an indispensable feed for animals: two-thirds of all high-protein feed for livestock and poultry is soybean meal. This program of research grants is aimed at identifying factors limiting further production increases from this versatile crop. Once limiting factors are identified, techniques can be developed to alleviate the problem. Past increases in productivity have been significant--with an average per-acre per-year increase of 0.4 bushels over the past 30 years. The desire is to continue to increase the productivity of soybeans.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: SOYBEAN RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Illinois Urbana, Illinois 61801	Glyceollin Effects on Mitochondria from Different Soybean Genotypes and Their Pathogens	David E. Koeppé	\$47,026	08/01/81	09/30/83
Iowa State Univ. of Science & Technology Ames, Iowa 50011	Evaluation of Carbon Losses by Soybean Plants	Richard M. Shibles	\$73,690	06/01/81	05/31/84
Kansas State Univ Manhattan, Kansas 66506	Genetic Manipulation of Leaf Temperatures in Soybeans	W. T. Schapaugh	\$98,606	05/15/81	09/30/85
Louisiana State Univ. & A&M College Baton Rouge, Louisiana 70803	Chemistry of Soybean Genotypes Resistant to Foliage-Feeding <u>Lepidoptera</u>	C. Michael Smith	\$100,000	06/01/81	09/30/83
Michigan State Univ. East Lansing, Michigan 48824	Biological Control of <u>Phytophthora</u> Root Rot of Soybean by Parasitic Microbes	John L. Lockwood	\$70,438	07/01/81	06/30/83
North Carolina Agric. Res. Service North Carolina State Univ. Raleigh, North Carolina 27650	Genetic Taxonomy of <u>Rhizobium</u> <u>japonicum</u> Affecting Nitrogen Fixation in Soybeans	Gerald H. Elkan	\$95,240	06/01/81	05/31/84

TOTAL: \$485,000

Antidesertification Research

The objectives of antidesertification research are to find more rapid, precise and economical methods of monitoring vegetation to detect trends in vegetation changes, and to find better and more economical methods of improving production from and conserving resources on land undergoing desertification.

One-third of the total land area of the world is arid, yet it is the homeland of 14 percent of the world's population. Inhabitants of these arid regions have modified the environment in various ways. Sometimes, the environmental modifications of these fragile lands, often in conjunction with drought, have resulted in a sustained decline and destruction of the biological productivity which may lead to increased erosion of the soil resource--a process termed desertification. Desertification has two components: a physical component related to recurring droughts which are a part of arid climates, and a social component related to population pressures and demands made on the land.

More economical and precise methods are needed for inventorying and monitoring vegetation on these vast arid and semiarid landscapes. Better techniques are needed to more rapidly detect changes in the primary production (changes both in the total amount and in the relative proportion among species) so that remedial action can be taken at the first signs

of stress. Also, more information is needed on the behavior of arid plant ecosystems to better identify stress symptoms and more accurately predict the consequences of management alternatives.

Cost-effective methods of restoring the productivity of lands undergoing desertification are needed. This involves the spectrum of activities from the rehabilitation of disturbed land, to manipulation of the plant cover by management practices to enhance production and conserve resources.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANTIDESERTIFICATION RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Arizona Tucson, Arizona 85721	Sensitivity to Change and Temporal Variability of Rangeland Monitoring Techniques	E. Lamar Smith	\$125,318	07/15/81	01/31/84
Univ. of Arizona Tucson, Arizona 85721	Strategies and Tactics for Conservation and Improvement of Dryland Resources	Martin M. Fogel	\$144,191	09/15/81	09/30/84
Univ. of Arizona Tucson, Arizona 85721	Ground and Aerial Assessment of Semiarid Rangelands	Charles F. Hutchinson	\$75,355	07/15/81	01/31/83
San Diego State Univ. San Diego, California 92182	Plant Characteristics to Reverse Desertification and Increase Production in Semiarid Lands	Philip C. Miller	\$147,135	07/15/81	07/31/84
Colorado State Univ. Fort Collins, Colorado 80523	Farming Systems to Stabilize Crop Production in Southeastern Colorado	Kenneth G. Brengle	\$118,096	07/15/81	07/14/86
Univ. of Idaho Moscow, Idaho 83843	Vegetation Change Analysis by the Frequency Plot Method: Development of Procedures	Minoru Hironaka	\$89,548	07/15/81	11/30/84
New Mexico State Univ. Las Cruces, New Mexico 88003	Monitoring Desertification Trends in Desert Grasslands of the U.S.A.-Mexico Border Region	John A. Ludwig	\$120,357	07/15/81	11/30/83
Utah State Univ. Logan, Utah 84322	Non-tillage Seeding to Reverse Desertification of Grass-Depleted Rangelands	Neil E. West	\$150,000	07/15/81	07/14/86

TOTAL: \$970,000

Animal Health

Overall, this research is to develop and/or refine abiotic and biotic methods to suppress animal losses from infectious and noninfectious diseases and internal and external parasites. The research is directed toward clarifying infectious and noninfectious diseases and parasites and their interactive effects on animal health; and to develop practical and implementable management systems for the producer to prevent or alleviate these causes of animal losses.

Research includes clarification of complex or unknown etiologies, development or improvement of diagnostic methodology, clarification of disease pathogenesis and methods of transmission, studies of resistance mechanisms and resistance enhancing factors and development of disease prevention, control or eradication technology.

Research is centered on highest priority animal health problems of beef and dairy cattle, swine, poultry, sheep, horses and aquaculture species as identified by the Animal Health Science Research Advisory Board. This includes studies on major causes of disease losses in beef and dairy cattle production such as the respiratory disease complex, reproductive diseases including brucellosis and anestrus, enteric and digestive diseases, mastitis, bluetongue, parasites and other serious problems. Research on swine centers on health hazards such as enteric and respiratory diseases, parasites and bone diseases causing lameness. Poultry disease studies include respiratory diseases, skeletal problems, enteric disorders

and leukosis. Sheep research includes respiratory disease, parasites and blue-tongue. Equine health research centers on respiratory disease, and musculoskeletal disorders. Research on diseases in aquaculture species also is included.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Auburn Univ. Auburn Univ., Alabama 36849	Liposome-Antibiotic Enhanced Bactericidal Activity of Phagocytic Cells	Ronald D. Schultz	\$40,320	08/01/81	07/31/82
Auburn Univ. Auburn Univ., Alabama 36849	<u>Isospora suis</u> of Baby Pigs: Pathogenesis and Immunology	William L. Current	\$88,834	07/01/81	06/30/84
Univ. of Arkansas Fayetteville, Arkansas 72701	Potentialtion of Other Disease Agents Following Alcaligenes Rhinotracheitis in Turkeys	John K. Skeeles	\$31,813	07/01/81	06/30/83
Univ. of California Davis, California 95616	Role of Blue Tongue Virus Polypeptides in Infection and Immunity of Sheep	Bennie I. Osburn	\$60,000	07/01/81	06/30/83
Colorado State Univ. Fort Collins, Colorado 80523	Cold-induced Pulmonary Hemodynamic Changes that Predispose to Bovine Pneumonia	David Robertshaw	\$126,045	08/01/81	07/31/83
Colorado State Univ. Fort Collins, Colorado 80523	Endocrine Factors Responsible for Postpartum Anestrus in Beef Cattle	Gordon D. Niswender	\$149,593	09/15/81	09/30/84
Colorado State Univ. Fort Collins, Colorado 80523	A New Immuno Chemical Approach to Identifying Mycobacteria in Cattle	Patrick J. Brennan	\$95,823	09/01/81	08/31/84
Univ. of Connecticut Storrs, Connecticut 06268	Immunoregulatory Role of Lymphocyte Subsets in Resistance to Bovine Mastitis	T. J. Yang	\$149,700	07/01/81	06/30/84
Univ. of Delaware Newark, Delaware 19711	The Role of Avian Reoviruses in Malabsorption and Associated Skeletal Disorders in Chickens	John Knox Rosenberger	\$60,923	07/01/81	06/30/84

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Florida Gainesville, Florida 32611	Evaluation of the Bovine Immune Response to Purified <u>Brucella abortus</u> Antigens	Edward M. Hoffman	\$127,656	07/01/81	06/30/84
Univ. of Georgia Athens, Georgia 30602	Pathophysiology of Acute Sarcosporidiosis and Related Abortion in Swine	Annie K. Prestwood	\$67,166	07/01/81	06/30/83
Univ. of Illinois Urbana, Illinois 61801	Vaccine for Transmissible Gastroenteritis (TGE) of Swine	Miodrag Ristic	\$80,000	08/01/81	07/31/84
Univ. of Illinois Urbana, Illinois 61801	Tissue Culture-Derived Vaccine for Bovine Anaplasmosis	Michael G. Levy	\$86,000	07/15/81	07/31/84
Purdue Univ. West Lafayette, Indiana 47907	Neuroendocrine Mechanisms Contributing to Postpartum Anestrus in Beef Cows	Gary E. Moss	\$149,433	07/01/81	06/30/84
Purdue Univ. West Lafayette, Indiana 47907	Nutrient Utilization and Animal Health as Affected by Antacid Materials	Carl H. Noller	\$105,247	09/01/81	08/31/83
Iowa State Univ. of Science & Technology Ames, Iowa 50011	Hypothalamic Control of Pituitary Hormones and Ovarian Function in Beef Heifers	Lloyd L. Anderson	\$127,055	09/01/81	08/31/84
Iowa State Univ. of Science & Technology Ames, Iowa 50011	Isolation of the Immunizing Subunit of Infectious Bovine Rhinotracheitis Virus	David E. Reed	\$115,275	09/01/81	08/31/84

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Kansas State Univ. Manhattan, Kansas 66506	Stress and Respiratory Disease in Beef Cattle	Marion R. Fedde	\$40,951	07/01/81	06/30/82
Louisiana State Univ. & A&M College Baton Rouge, Louisiana 70893	<u>In vitro</u> Model for the Pathogenesis of Equine Viral Respiratory Diseases	Charles J. Issel	\$30,233	07/01/81	06/30/83
Univ. of Maryland College Park, Maryland 20742	Antigenic Assessment of Avian Coronaviruses by Monoclonal Antibodies	Warren W. Marquardt	\$60,000	09/01/81	08/31/83
Univ. of Maryland College Park, Maryland 20742	Production of Monoclonal Antibodies to Mastitis- Related Antigens	Richard A. Goldsby	\$25,000	09/01/81	08/31/82
Michigan State Univ. East Lansing, Michigan 48824	Intestinal P-cresol Production and Pulmonary Toxicity in the Young Pig	Melvin T. Yokoyama	\$56,728	09/01/81	08/31/83
Michigan State Univ. East Lansing, Michigan 48824	Influence of Enteric Disease on Nutrient Assimilation in Calves	Thomas H. Herdt	\$20,756	09/01/81	08/31/82
Michigan State Univ. East Lansing, Michigan 48824	Anthelmintic Treatment of Dairy Cows: Effect on Hormonal Determinants of Milk Yield	T. Schillhorn van Veen	\$39,997	09/01/81	08/31/82
Michigan State Univ. East Lansing, Michigan 48824	Pili Vaccines to <u>Salmonella</u> in Poultry	Robert J. Moon	\$54,077	09/01/81	08/31/83

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Minnesota St. Paul, Minnesota 55104	Pulmonary Defense Against Bovine Pasteurellosis: An Evaluation of Two Unique Vaccines	Samuel K. Maheswaran	\$150,000	07/01/81	06/30/84
Univ. of Minnesota St. Paul, Minnesota 55104	Control of Respiratory <u>Escherichia coli</u> Infections in Turkeys	Kabambi V. Nagaraja	\$73,187	07/15/81	07/31/84
Univ. of Minnesota St. Paul, Minnesota 55104	Use of Immunomodulators as Potentiating Agents in Turkey Herpes Virus (HVT) Vaccinated Chickens	V. Sivanandan	\$29,730	07/15/81	07/31/83
Univ. of Minnesota St. Paul, Minnesota 55104	Osteochondrosis/Osteoarthrosis of Pigs: Factors Influencing the Pathogenesis	Harvey D. Hilley	\$94,000	07/15/81	12/31/83
Univ. of Minnesota St. Paul, Minnesota 55104	Compounds Affecting Pathogenicity of <u>Escherichia coli</u> Isolated from Young Pigs	Sally E. Jorgensen	\$40,000	07/01/81	07/30/84
Univ. of Minnesota St. Paul, Minnesota 55104	Pathogenesis of <u>Fusarium</u> - induced Tibial Dyschondro- plasia in Poultry	Mary M. Walser	\$73,000	09/01/81	08/31/84
Univ. of Missouri Columbia, Missouri 65211	Immunodiagnosis of Bovine Ostertagiosis	Robert M. Corwin	\$35,000	07/01/81	06/30/82
Univ. of Nebraska Lincoln, Nebraska 68583	Bovine Respiratory Syncytial Virus: Pathogenesis and Immune Response	Alfonso Torres-Medina	\$148,742	07/01/81	06/30/84

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68583	Atrophic Rhinitis of Swine: Early Detection of the Disease and Causative Agent	Marvin B. Rhodes	\$50,000	07/01/81	06/30/84
Agric. Expt. Station Rutgers--The State Univ. New Brunswick, New Jersey 08903	Registration of Drugs for Minor/Major Animal Diseases	Robert H. Kupelian	\$97,000	07/01/81	06/30/83
Cornell Univ. Ithaca, New York 14853	Intraphagocytic Killing of <u>Salmonella typhimurium</u> by Liposome-Encapsulated Antibiotics	Samuel G. Campbell	\$102,946	07/01/81	06/30/84
Cornell Univ. Ithaca, New York 14853	Evaluation of a <u>Staphylococcus</u> <u>aureus</u> Vaccine for Bovine Mastitis	Neil L. Norcross	\$104,283	07/01/81	06/30/84
Cornell Univ. Ithaca, New York 14853	Pathogenesis and Pathologic Sequelae of Bovine Respiratory Syncytial Virus Infection in Calves	William L. Castleman	\$149,768	08/01/81	07/31/84
Cornell Univ. Ithaca, New York 14853	Acute Diarrheal Diseases of Neonatal Calves: Non-anti biotic Methods for Control	Bud C. Tennant	\$59,231	08/01/81	07/31/83
Cornell Univ. Ithaca, New York 14853	The Vaccine Potential of M Protein Rich Extracts of <u>S.</u> <u>equi</u> in the Horse	John F. Timoney	\$43,767	07/01/81	06/30/82
Agric. Expt. Station North Dakota State Univ. Fargo, North Dakota 58105	The Epidemiology and Pathogenesis of Ovine Progressive Pneumonia	Ithel A. Schipper	\$60,000	09/15/81	09/30/83

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Ohio State Univ. Columbus, Ohio 43210	HVT in Cell Proliferation: A Risk Factor in Dissecting Aneurysms	John Philip Donahoe	\$28,270	07/01/81	06/30/82
Ohio State Univ. Columbus, Ohio 43210	A Sustained Release Parental Dosage Form of Magnesium for the Prevention of Hypo- magnesemia	Glen F. Hoffsis	\$90,000	07/01/81	06/30/83
Ohio State Univ. Columbus, Ohio 43210	Hypobiotic and Antigenic Changes in <u>Ostertagia</u> <u>Ostertagi</u> During Environmental Adaptation	Rupert P. Herd	\$90,000	09/01/81	08/31/83
Oregon State Univ. Corvallis, Oregon 97331	Protection of Sheep Against Liver Fluke Disease by Immunological Methods	Gary L. Zimmerman	\$72,000	07/01/81	06/30/82
Oregon State Univ. Corvallis, Oregon 97331	Development of a Rapid Diagnostic Test for Johne's Disease	A. Morrie Craig	\$74,000	09/01/81	06/30/83
Univ. of Pennsylvania Phila., Pennsylvania 19104	IBR Virus: Strain Specific Identification by DNA Finger- printing and Analysis of Latency	William C. Lawrence	\$146,446	07/01/81	06/30/84
Univ. of Pennsylvania School of Vet. Medicine Phila., Pennsylvania 19104	Fatigue Fractures of the Metacarpus: A Morphological and Biomechanical Study in the Horse	David M. Nunamaker	\$70,000	09/01/81	08/31/83
Pennsylvania State Univ. Univ. Park, Pennsylvania 16802	Cellular and Biochemical Changes Associated with Tibial Dyschondroplasia	Roland M. Leach	\$100,000	09/01/81	08/31/83

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Pennsylvania State Univ. Univ. Park, Pennsylvania 16802	Effects of Fat Globules and Immunoglobulins on Neutrophils During the Dry Period	Robert J. Eberhart	\$30,000	09/01/81	08/31/82
Univ. of Rhode Island Kingston, Rhode Island 02881	Mass Testing Procedures Using Egg Yolk to Determine Antibody to Respiratory Diseases	Vance J. Yates	\$65,000	09/15/81	09/30/83
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Pulmonary Defense Against <u>P.</u> <u>Hemolytica</u> in Normal, Immunized and Infected Cattle	Harland W. Renshaw	\$149,996	09/01/81	08/31/84
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Early Warning Indicators of Environmental Stress in Craw- fish	Raymond F. Sis	\$47,957	07/01/81	06/30/83
Virginia Polytechnic Inst. & State Univ. Blacksburg, Virginia 24061	Colostrum Carbohydrates Which Protect Neonatal Pigs Against Enteric Infection	W. N. Eigel	\$67,000	09/01/81	08/31/83
Virginia Polytechnic Inst. & State Univ. Blacksburg, Virginia 24061	<u>Brucella abortus</u> Antigens: Isolation, Biological Functions and Diagnostic Value	Gerhardt G. Schurig	\$111,645	08/01/81	07/31/84
Virginia Polytechnic Inst. & State Univ. Blacksburg, Virginia 24061	Genetic Enhancement of Resistance to Enteric and Respiratory Diseases in Piglets	Gerhardt G. Schurig	\$80,272	09/01/81	08/31/84

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Wisconsin Madison, Wisconsin 53706	In Vivo Effects of <u>Brucella</u> <u>abortus</u> Antigens on Bovine Immune Responses	Gary A. Splitter	\$149,690	09/01/81	08/31/84
Univ. of Wisconsin Madison, Wisconsin 53706	Genetic Improvement of Resistance to Mastitis in Dairy Cattle	George E. Shook	\$77,017	09/01/81	08/31/84
Univ. of Wyoming Laramie, Wyoming 82071	Carcass Energy Content and Pituitary and Ovarian Function in Anestrous Beef Cows	Thomas G. Dunn	\$149,928	09/01/81	08/31/84

TOTAL: \$4,898,500

Aquaculture

This research is to provide and/or improve upon the scientific and technical base needed by the aquaculture industry. This industry has been expanding rapidly. Problems of nutrition, breeding, physiology, management, disease and parasite control are important and are becoming more limiting as the size of the industry and its concentration have increased.

Interest focused on local and regional problems for which solutions will contribute to national objectives related to aquaculture production.

The specific objectives of the program are: (1) improved production efficiency in diet formulation, reproduction and breeding, disease and parasite control; (2) requirements for improved water quality for production and factors affecting the quality of water discharge; and (3) increased production of freshwater species having high production potential such as catfish, trout, bait minnows, and crawfish.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: AQUACULTURE RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Auburn Univ. Auburn Univ., Alabama 36849	Off-Flavor in Pond-Raised Catfish	Richard T. Lovell	\$67,520	07/01/81	06/30/83
Auburn Univ. Auburn Univ., Alabama 36849	Effects of Environmental Temperature on Protective Immunity in Channel Catfish	John A. Plumb	\$18,225	08/01/81	01/31/83
Univ. of California Davis, California 95616	Selection Method for a Sex Limited Trait in Rainbow Trout	Graham A. E. Gall	\$60,872	09/01/81	08/31/84
Univ. of Hawaii Honolulu, Hawaii 96822	Water Quality Control in Freshwater Prawn Ponds	Edward A. Laws	\$79,966	09/01/81	08/31/83
For., Wildlife & Range Expt. Station Univ. of Idaho Moscow, Idaho 83843	Environmental Gill Disease in Rainbow Trout	George W. Klontz	\$79,074	09/01/81	08/31/83
MS Agric/For. Expt. Stn. Mississippi State Univ. Missi. State, Mississippi 39762	Determination of Digestible Energy Values of Feedstuffs for Channel Catfish	Robert P. Wilson	\$32,775	09/01/81	08/31/83
Oregon State Univ. Corvallis, Oregon 97331	Bacterial Kidney Disease of Salmonid Fish	John S. Rohovec	\$79,343	09/15/81	09/30/83
Agric. Expt. Station Univ. of Tennessee Knoxville, Tennessee 37901	Digestibility of High Energy and High Protein Feedstuffs for Channel Catfish	Richard J. Strange	\$29,958	09/01/81	08/31/83

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: AQUACULTURE RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL	AMOUNT	AGREEMENT PERIOD	
		INVESTIGATOR		FROM	TO
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Fatty Acid Requirements of Channel Catfish	Robert R. Stickney	\$37,267	07/01/81	06/30/82

TOTAL: \$485,000

ENERGY AND ALCOHOL FUELS RESEARCH GRANTS PROGRAM

The emphasis in this research is on the production and use of renewable energy sources. The USDA Science and Education funds involve Ethyl Alcohol Research covering the evaluation, production, handling, treatment, and conversion of biomass resources for manufacture of ethyl alcohol. Energy research grants (Special Research Grants Program), support research in the following four specific areas: fermentation; combustion, pyrolysis, and gasification; solar and wind energy; and biomass varietal screening, collection, and storage.

The Department of Energy funds involve research to obtain the scientific knowledge and technical information required to reduce the petrochemical energy used in agricultural and forestry production and other rural activities in the five following areas: methane generation and utilization; combustion, pyrolysis, and gasification; solar energy (solar systems used for single purposes or processes and multiple-use and/or multiple source solar systems); biomass production; and use of vegetable oil as diesel substitutes.

The total funding available for these programs is \$6,184,100, of which \$2,328,000 is available from USDA and the remaining funds are from the Department of Energy (DOE).

The Energy and Alcohol Fuels Research Grants Programs is authorized by Section 1419 of the Food and Agriculture Act of 1977, P.L. 95-113, as amended by P.L. 96-294 (7 U.S.C. 3154); the Federal Grant and Cooperative Agreement Act of 1977, P.L. 95-224 (41 U.S.C. 501 et seq.), Section 2(c)1 of the Act of August 4, 1965; P.L. 89-106, as amended by Section 1414 of P.L. 95-113 (7 U.S.C. 450i); Section 9 of the Solar Heating and Cooling Demonstration Act of 1974 (42 U.S.C. 5507), P.L. 93-409; Solar Energy Research, Development, and Demonstration Act (42 U.S.C. 5551), P.L. 93-473; subsection 4(c) of the Federal Nonnuclear Energy Research and Development Act of 1974, P.L. 93-577, as amended (42 U.S.C. 5903 (c)); subsection 104(i) of the Energy Reorganization Act of 1974, P.L. 93-438, as amended (42 U.S.C. 5814(i)); and the Research and Marketing Act of 1946, as amended (7 U.S.C. 427i, 1621-29). S&E is administering this program partly with pass-through funds from the Department of Energy. Qualified scientists in FY 1981 associated with the State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal and State agencies, and private organizations or corporations were eligible to apply for grants.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ENERGY RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Alaska Fairbanks, Alaska 99701	Increasing Crop Maturation in Alaska and Improving Soil Moisture Retention at Spring Run Off by Accelerating Snow Melt	Joseph G. Holty	\$70,900	09/15/81	03/31/83
Univ. of California Davis, California 95616	A Comparison of High Energy Crops for Fuel Production	Shu Geng	\$23,600	09/15/81	09/30/83
Univ. of Georgia Athens, Georgia 30602	Energy Analysis of <u>Helianthus</u> <u>tuberosus</u> at Varying Growth and Storage Input Levels	Stanley J. Kays	\$68,400	09/15/81	09/30/83
Univ. of Idaho Moscow, Idaho 83843	Rapid Fermentation with Flocculating Yeast Mutants	Roger A. Korus	\$72,000*	09/15/81	09/30/83
Purdue Univ. West Lafayette, Indiana 47907	Production of Liquid Fuel From Hemicellulose Hydrolyzate	Martin M.Y. Chang	\$124,600	09/15/81	09/30/83
Purdue Univ. West Lafayette, Indiana 47907	Herbaceous Biomass Crops for Marginal Lands	Victor L. Lechtenberg	\$80,000	09/15/81	01/31/84
Iowa State Univ. of Science & Technology Ames, Iowa 50011	The Harvest and Collection of Corncobs for Energy	Wesley F. Buchele	\$21,800	09/15/81	09/30/82

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ENERGY RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Kansas State Univ. Manhattan, Kansas 66506	Fluid Bed Gasification of Crop Residues for Gaseous and Liquid Fuel Production	Walter P. Walawender	\$116,900	09/15/81	09/30/83
Kansas State Univ. Manhattan, Kansas 66506	Harvesting and Storage of Sweet Sorghum Biomass	Gerry L. Posler	\$45,900	09/15/81	12/31/83
Kansas State Univ. Manhattan, Kansas 66506	Space Heating with a Wind- powered Self-excited Induction Generator	Gary L. Johnson	\$76,500	09/15/81	09/30/83
Louisiana State Univ. & A&M College Baton Rouge, Louisiana 70803	Production of Saccharum Genotypes for Biomass Yield and Determination of Their Fuel Potential	Mike J. Giamalva	\$79,300	09/15/81	09/30/83
Univ. of Minnesota St. Paul, Minnesota 55104	Woody Bioenergy Crops on Marginal Land	Rouse S. Farnham	\$79,900	09/15/81	09/30/83
Agric. Expt. Station Univ. of Nebraska Lincoln, Nebraska 68583	Biogas Production from Dry Beef Cattle Manure	Dennis D. Schulte	\$31,200	09/15/81	09/30/82
Cornell Univ. Ithaca, New York 14853	Co-generation of Electricity and Heat from Biogas	William J. Jewell	\$116,000	09/15/81	09/30/83
North Carolina State Univ. Raleigh, North Carolina 27650	Hydrolysis of Wood Cellulose with Hydrochloric Acid Enhanced by Cations	Irving S. Goldstein	\$80,000	09/15/81	09/30/83

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ENERGY RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
North Carolina State Univ. Raleigh, North Carolina 27650	The Potential of the Species of <u>Rhus</u> L., subgenus <u>Rhus</u> , for the Agricultural Production of Energy Biomass	Lyle L. Phillips	\$40,300	09/15/81	09/30/84
Agric. Expt. Station North Dakota State Univ. Fargo, North Dakota 58105	Sunflower Biomass as an Energy Source	James A. Lindley	\$60,200	09/15/81	03/31/84
Ohio Agric. Res. & Dev. Center Wooster, Ohio 44691	Development of a Fluidized-Bed Corncob Combustor	Harold M. Keener	\$102,000	09/15/81	09/30/83
Lehigh Univ. Bethlehem, Pennsylvania 18015	Strain Development for Thermophilic Butanol Production from Biomass	Bland S. Montenecourt	\$80,000	09/15/81	09/30/83
Univ. of Rhode Island Kingston, Rhode Island 02881	An Optimized Acetone-Butanol Fermentation and Solvent Recovery System	Richard W. Traxler	\$78,000	09/15/81	09/30/83
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Fluidized-Bed Biomass Gasifier-Boiler System Evaluation and Design	Wayne A. LePori	\$121,500	09/15/81	09/30/83
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Liquid Engine Fuels from Biomass Pyrolytic Tars	Ed J. Soltes	\$125,000	09/15/81	09/30/83

SPECIAL RESEARCH GRANTS PROGRAM
 PROGRAM AREA: ENERGY RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Virginia Polytechnic Inst. & State Univ. Blacksburg, Virginia 24061	Lignin's Potential Contri- bution to the Feasibility of Biomass Conversions to Ethanol	Wolfgang G. Glasser	\$80,000	09/16/81	09/30/83
Univ. of Wisconsin Madison, Wisconsin 53706	Thermochemical Fractionation and Liquefaction of Wood to Fuels and Chemicals	Raymond A. Young	\$79,000	09/15/81	09/30/84

TOTAL: \$1,843,000

*PLEASE NOTE THAT GRANT HAS BEEN-SPLIT FUNDED, ONLY PERTINENT AMOUNT INCLUDED IN PROGRAM TOTAL
 \$10,000 - Alcohol & Industrial Hydrocarbons Program
 (Ethyl Alcohol Research)
 \$62,000 - Special Research Grants Program
 (Energy Research--Fermentation)

ALCOHOLS AND INDUSTRIAL HYDROCARBONS PROGRAM
PROGRAM AREA: ETHYL ALCOHOL RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Idaho Moscow, Idaho 83843	Rapid Fermentation with Flocculating Yeast Mutants	Roger A. Korus	\$72,000*	09/15/81	09/30/83
Purdue Univ. West Lafayette, Indiana 47907	Improvement of Yeast Alcohol Fermentation Via Genetic Engineering	Nancy W.Y. Ho	\$80,000	09/15/81	09/30/83
Massachusetts Inst. of Technology Cambridge, Massachusetts 02139	Xylose Fermentation by Yeast	Anthony J. Sinskey	\$100,000	09/15/81	09/30/83
MS For. Products Utilization Lab Mississippi State Univ. MS State, Mississippi 39762	Evaluation of a Steam Explosion Pretreatment of Alcohol Production from Biomass	Gary D. McGinnis	\$100,000	09/15/81	09/30/84
Agric. Expt. Station Rutgers, The State Univ. New Brunswick, New Jersey 08903	Ethanol from <u>Zymomonas</u> Fermentation - Improving Tolerance and Production Level	Theodore Chase	\$97,000	09/15/81	09/30/83
Brooklyn College c/o Res. Fdn. of CUNY New York, New York 10036	Construction of Yeast Strains Exhibiting Elevated Levels of Ethanol Production	Stephen F. Cottrell	\$98,000	09/15/81	09/30/83

TOTAL: \$485,000

*PLEASE NOTE THAT GRANT HAS BEEN SPLIT-FUNDED, ONLY PERTINENT AMOUNT INCLUDED IN PROGRAM TOTAL.
 \$10,000 - Alcohol & Industrial Hydrocarbons Program
 (Ethyl Alcohol Research)
 \$62,000 - Special Research Grants Program
 (Energy Research--Fermentation)

ENERGY SYSTEMS FOR AGRICULTURE PROGRAM
PROGRAM AREA (TO INCLUDE): METHANE GENERATION AND UTILIZATION, COMBUSTION, PYROLYSIS, AND GASIFICATION
SOLAR ENERGY--SINGLE USE, SOLAR ENERGY MULTIPLE USE, AND, VEGETABLE OIL AS DIESEL SUBSTITUTE

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Arizona Board of Regents Tempe, Arizona 85281	Catalytic Conversion of Biomass-derived Synthesis Gas to Diesel Fuel in a Slurry Reactor	James L. Kuester	\$122,000	09/15/81	09/30/83
California Polytechnic State Univ. Fdn. San Luis Obispo, California 93407	Solar-heated Brooder House	Edgar J. Carnegie	\$14,500	09/15/80	09/30/82
Lockheed Missiles & Space Co., Inc. 1111 Lockheed Way Sunnyvale, California 94086	Annual Cycle Solar Regener- ation of Desiccants for Crop Drying	James W. Fletcher	\$42,300	09/15/80	09/30/82
Colorado State Univ. Fort Collins, Colorado 80523	Alfalfa - A Promising Biomass Energy Resource	Bruce E. Dale	\$79,200	09/15/81	09/30/83
Simco Incorporated 61 River Rd. Weston, Connecticut 06883	Chinese Tallow, A Petroleum Substitute: Varietal Screening and Processing	H. William Scheld	\$80,000	09/15/81	09/30/82
Univ. of Delaware Newark, Delaware 19711	Techniques and Component Designs for a Cost-effective Solar Brooding System	Norman E. Collins	\$50,000	09/15/80	09/30/82
Inst. of Food & Agric. Sciences Univ. of Florida Gainesville, Florida 32611	Dual-mode Solar Regeneration of Solid Desiccants for Food Drying	William M. Miller	\$10,900	09/15/80	09/30/82

ENERGY SYSTEMS FOR AGRICULTURE PROGRAM
PROGRAM AREA (TO INCLUDE): METHANE GENERATION AND UTILIZATION, COMBUSTION, PYROLYSIS, AND GASIFICATION
SOLAR ENERGY--SINGLE USE, SOLAR ENERGY MULTIPLE USE, AND, VEGETABLE OIL AS DIESEL SUBSTITUTE

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Florida Gainesville, Florida 32611	Fuel Chipping and Continuous Feeding Systems for Downdraft Gasifiers	Lawrance N. Shaw	\$46,200	09/15/81	09/30/83
Univ. of Georgia Res. Fdn., Inc. Athens, Georgia 30602	Wood Biomass Energy for Agriculture and Industry	Glenn C.W. Ames	\$79,800	09/15/81	09/30/83
Univ. of Georgia Res. Fdn., Inc. Athens, Georgia 30602	Study of On-farm Handling and Storage of Peanuts as an Emergency Diesel Fuel for Farms	John W. Goodrum	\$95,900	09/15/81	09/30/83
Hawaii Inst. of Tropical Agric. & Human Resources Univ. of Hawaii-Manoa Honolulu, Hawaii 96822	A Hybrid Solar-biogas System for Food Dehydration	James H. Moy	\$28,400	09/15/80	09/30/82
Illinois State Univ. Normal, Illinois 61761	Grass Biomass Production for Energy Conversion	Roger C. Anderson	\$3,300	09/15/81	12/31/81
NCR, ARS, S&E, USDA 2000 W. Pioneer Parkway Peoria, Illinois 61615	Anaerobic Fermentation of Manure-crop Residue Mixtures	Andrew G. Hashimoto	\$147,000	09/15/81	09/30/83
NCR, ARS, S&E, USDA 2000 W. Pioneer Parkway Peoria, Illinois 61615	Corn Crop Residue from Combines as an Energy Source for Grain Drying on Farms	Gerald L. Kline	\$124,800	09/15/81	09/30/83

ENERGY SYSTEMS FOR AGRICULTURE PROGRAM
PROGRAM AREA (TO INCLUDE): METHANE GENERATION AND UTILIZATION, COMBUSTION, PYROLYSIS, AND GASIFICATION
SOLAR ENERGY--SINGLE USE, SOLAR ENERGY MULTIPLE USE, AND, VEGETABLE OIL AS DIESEL SUBSTITUTE

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Illinois Urbana, Illinois 61801	Effect of Nonpetroleum Fuels on Durability of Direct- injection Diesel Engines	Carroll E. Goering	\$124,300	09/15/81	09/30/83
Purdue Univ. West Lafayette, Indiana 47907	Solar Energy for Heating Greenhouses and Plant Soil	Alvin C. Dale	\$59,600	09/15/80	09/30/82
Purdue Univ. West Lafayette, Indiana 47907	Alternate Fuel Systems for Drying Crops	George H. Foster	\$124,600	09/15/80	03/31/83
Purdue Univ. West Lafayette, Indiana 47907	Use of Solar Energy and Biomass for the Concentration of Liquid Foods	Martin R. Okos	\$82,200	09/15/80	09/30/82
Agric. & Home Econ. Expt. Stn. Iowa State Univ. of Science & Technology Ames, Iowa 50011	Improved Annual Efficiency of Solar-assisted Swine Unit by Microcomputer Control	Dwaine S. Bundy	\$12,200	09/15/80	09/30/82
Iowa State Univ. of Science & Technology Ames, Iowa 50011	Corn Drying Using Heat from a Direct-fired Crop Residue Furnace	Carl J. Bern	\$72,500	09/15/81	09/30/83
Kansas State Univ. Manhattan, Kansas 66506	Soybean Oil Esters as a Renewable Fuel for Diesel Engines	Stanley J. Clark	\$92,600	09/15/81	03/31/83
Kansas State Univ. Manhattan, Kansas 66506	Using Exhausted Carbon Dioxide to Increase Solar Energy Use in Greenhouses	Charles K. Spillman	\$55,400	09/15/80	01/31/83
Univ. of Kentucky Lexington, Kentucky 40506	Heat Storage and Focusing Solar Collector for Agriculture	Blaine F. Parker	\$60,000	09/15/80	09/30/82

ENERGY SYSTEMS FOR AGRICULTURE PROGRAM
PROGRAM AREA (TO INCLUDE): METHANE GENERATION AND UTILIZATION, COMBUSTION, PYROLYSIS, AND GASIFICATION
SOLAR ENERGY--SINGLE USE, SOLAR ENERGY MULTIPLE USE, AND, VEGETABLE OIL AS DIESEL SUBSTITUTE

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Kentucky Lexington, Kentucky 40506	Integrated Multiple-use Solar System with Biomass Gasification- Combustion Backup	Otto J. Loewer	\$100,000	09/15/80	09/30/83
SR, ARS, S&E, USDA P.O. Box 53326 New Orleans, Louisiana 70153	Solar Energy for Crop Drying and Curing in the Southeast	John M. Troeger	\$10,000	09/15/80	09/30/82
SR, ARS, S&E, USDA P.O. Box 53326 New Orleans, Louisiana 70153	Direct Solar/Wind Hybrid Food Dryers for Farms and Cooperatives	Charles J. Wagner	\$70,000	09/15/80	09/30/82
Univ. of Maine Orono, Maine 04469	Development of an Integrated System for Utilization of Particulate Wood and Other Biomass Fuels for Space and Process Heat	John G. Riley	\$100,000	09/15/81	09/30/83
NER, ARS, S&E, USDA BARC-West Beltsville, Maryland 20705	Information Summaries on 200 Energy Species	James A. Duke	\$80,000	09/15/81	09/30/83
Univ. of Maryland College Park, Maryland 20742	Energy and Economic Benefits of Vegetable Oils as Fuel Extenders	Ali Farsaie	\$135,200	09/15/81	09/30/83
Univ. of Massachusetts Amherst, Massachusetts 01003	Use of Solar-concentrated Water-absorbing Brines to Concentrate Liquid Foods	Henry G. Schwartzberg	\$65,000	09/15/80	09/30/83
Univ. of Nebraska Lincoln, Nebraska 68583	Solar Energy System for Livestock Production Facilities	Gerald R. Bodman	\$51,100	09/15/80	09/30/82

ENERGY SYSTEMS FOR AGRICULTURE PROGRAM
PROGRAM AREA (TO INCLUDE): METHANE GENERATION AND UTILIZATION, COMBUSTION, PYROLYSIS, AND GASIFICATION
SOLAR ENERGY--SINGLE USE, SOLAR ENERGY MULTIPLE USE, AND, VEGETABLE OIL AS DIESEL SUBSTITUTE

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Univ. of Nebraska Lincoln, Nebraska 68583	Drying Scheduling Across the North Central Region	Thomas L. Thompson	\$14,300	09/15/80	09/30/82
Univ. of Nevada Reno, Nevada 89506	Containerized Storage of Heat	Christo G. Stojanoff	\$60,000	09/15/81	09/30/82
Agric. Expt. Station Rutgers--The State Univ. New Brunswick, New Jersey 08903	Greenhouse Heating with Summer Collector Utilization	David R. Mears	\$25,000	09/15/80	09/30/82
Cornell Univ. Ithaca, New York 14853	Solar Refrigeration for Agriculture and Food Processing	David C. Ludington	\$150,100	09/15/81	09/30/83
Cornell Univ. Ithaca, New York 14853	A Passive Solar Heating System for Commercial Greenhouses	Louis D. Albright	\$60,100	09/15/80	09/30/82
Agric. Res. Service North Carolina State Univ. Raleigh, North Carolina 27650	CO ₂ Enrichment in Solar Energy Collection/Storage Systems for Greenhouses	Daniel H. Willits	\$77,000	09/15/81	09/30/84
Univ. of North Dakota Grand Forks, North Dakota 58202	Sunflower Oil Methyl Ester as a Diesel Fuel	David J. Hassett	\$58,900	09/15/81	09/30/82
Ohio Agric. Res. & Dev. Center Wooster, Ohio 44691	A Solar-heated Nighttime- insulated Greenhouse System	Ted H. Short	\$149,900	09/15/81	09/30/83

ENERGY SYSTEMS FOR AGRICULTURE PROGRAM
PROGRAM AREA (TO INCLUDE): METHANE GENERATION AND UTILIZATION, COMBUSTION, PYROLYSIS, AND GASIFICATION
SOLAR ENERGY--SINGLE USE, SOLAR ENERGY MULTIPLE USE, AND, VEGETABLE OIL AS DIESEL SUBSTITUTE

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Oregon State Univ. Corvallis, Oregon 97331	Meadowfoam Development and Production as a Source of Industrial Hydrocarbons	Gary D. Jolliff	\$80,000	09/15/81	09/30/83
Univ. of Puerto Rico San Juan, Puerto Rico 00935	Co-production of Tropical Legumes and Tropical Grasses as a Renewable Energy Source	Alex G. Alexander	\$150,000	09/15/81	09/30/84
South Dakota State Univ. Brookings, South Dakota 57007	Multiple-use Agricultural Solar System Design, Development, and Evaluation	Mylo A. Hellickson	\$55,200	09/15/80	09/30/82
Agric. Expt. Station Univ. of Tennessee Knoxville, Tennessee 37901	A Multi-use Modular Dryer for Large Hay Packages Using Solar-heated Air	Bobby L. Bledsoe	\$40,000	09/15/80	09/30/82
Texas A&M Univ. College Station, Texas 77843	Tinted Glass Solar Collector for Covering, Heating, and Cooling Greenhouses	Cornelius van Bavel	\$61,500	09/15/81	09/30/82
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Engineering Analysis of Cottonseed Oil and Animal Fats as Diesel Fuel	Wayne A. LePori	\$125,000	09/15/81	09/30/83
Agric. Expt. Station Texas A&M Univ. College Station, Texas 77843	Maximizing Biomass Production in Semi-arid Regions: Genotypic Selection	Ronald J. Newton	\$80,000	09/15/81	09/30/84
Southwest Res. Inst. 6220 Culebra Road POD 28510 San Antonio, Texas 78284	Development of a Preliminary Specification for Vegetable Oil Fuel for Diesel Engines	Thomas W. Ryan	\$153,100	09/15/81	09/30/82

ENERGY SYSTEMS FOR AGRICULTURE PROGRAM
PROGRAM AREA (TO INCLUDE): METHANE GENERATION AND UTILIZATION, COMBUSTION, PYROLYSIS, AND GASIFICATION
SOLAR ENERGY--SINGLE USE, SOLAR ENERGY MULTIPLE USE, AND, VEGETABLE OIL AS DIESEL SUBSTITUTE

GRANTS AWARDED FOR FISCAL YEAR 1981

INSTITUTE	TITLE	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD	
				FROM	TO
Plant Resources Inst. 360 Wakara Way Salt Lake City, Utah 84108	Screening of Western U.S. Plants for Biomass and Energy Sources	Robert P. Adams	\$150,000	09/15/81	09/30/84
The Memphremagog Group P.O. Box 456 Newport, Vermont 05855	Air-to-air Heat Exchangers for Livestock Shelters and Greenhouses	Lawrence B. Hamilton	\$22,600	09/15/80	09/30/82
Washington State Univ. Pullman, Washington 99164	Direct Pasteurization of Fluid Foods Utilizing Solar Energy	Denny C. Davis	\$61,900	09/15/80	09/30/82
Washington State Univ. Pullman, Washington 99164	Hop Drying and Greenhouse Heating with Solar and Biomass Energy	Glenn A. Kranzler	\$62,500	09/15/80	09/30/82

TOTAL: \$3,856,100.00

SCIENTISTS WHO SERVED ON S&E PEER PANELS FOR FY 1981

Scientists from government, universities, and industry served on the S&E peer panels this past year. Each panel was put together to fit the expertises needed for that specific granting area. The scientists involved are listed below by State and by institution or organization.

ALABAMA

C. R. Rossi
Auburn University

R. D. Smitherman
Auburn University

B. Truelove
Auburn University

M. Floyd
Alabama A&M University

B. T. Whatley
Tuskegee Institute

ARKANSAS

S. Y. Young
University of Arkansas

S. H. Newton
University of Arkansas-Pine Bluff

CALIFORNIA

S. S. Elberg
University of California-Berkeley

N. F. Baker
University of California-Davis

CALIFORNIA--continued

R. A. Bankowski
University of California-Davis

A. J. Clifford
University of California-Davis

G. A. E. Gall
University of California-Davis

John Goss
University of California-Davis

R. F. Norris
University of California-Davis

C. O. Qualset
University of California-Davis

H. T. Reynolds
University of California-Riverside

R. Goldberg
University of California-Los Angeles

Bryon Jenkins
P. G. & E.-San Francisco

Robert Inman
ARCO Ventures Co.-Los Angeles

COLORADO

George Van Dyne
Colorado State University

F. A. Murphy
Colorado State University

G. R. Jansen
Colorado State University

Richard Driscoll
Forest Service-USDA

Wayne Willis
ARS-USDA Western Region

Dan Jantzen
ARS-USDA
Solar Energy Research Institute

Van Morris
ARS-USDA
Solar Energy Research Institute

DISTRICT OF COLUMBIA

Clarence Becker
CSRS-USDA

Elwood Olver
Science and Education-USDA

DISTRICT OF COLUMBIA--continued

Clyde Richards
CSRS-USDA

C. B. Rumburg
CSRS-USDA

Paul Schleusener
CSRS-USDA

Earl Splitter
CSRS-USDA

Howard Teague
CSRS-USDA

Eleanor Sabadell
Department of Interior

E. Butler
Howard University

FLORIDA

G. E. Bowes
University of Florida

P. A. Nicolette
University of Florida

GEORGIA

C. D. Berdanier
University of Georgia

H. R. Boerma
University of Georgia

E. V. DeBuysscher
University of Georgia

GEORGIA--continued

W. K. Wynn
University of Georgia

Gordon Monroe
ARS-USDA
Coastal Plain Experiment Station

Ralph Prince
ARS-USDA

IDAHO

Charles Peterson
University of Idaho

ILLINOIS

J. W. Erdman, Jr.
University of Illinois

R. M. Goodman
University of Illinois

R. H. Hageman
University of Illinois

T. D. Ho
University of Illinois

P. Johnston
University of Illinois-Urbana

W. Ralph Nave
University of Illinois

M. Ristic
University of Illinois

George Kapusta
Southern Illinois University

ILLINOIS--continued

W. M. Lewis
Southern Illinois University

Dwight Miller
ARS-USDA
Northern Reg. Research Center

Karl Smiley
ARS-USDA
Northern Reg. Research Center

E. H. Pryde
ARS-USDA
Northern Reg. Research Center

L. H. Princen
ARS-USDA
Northern Agrl. Energy Center

INDIANA

J. R. Barrett
Purdue University

R. A. Dilley
Purdue University

Michael R. Ladisch
Purdue University

B. A. Larkins
Purdue University

Robert M. Peart
Purdue University

J. A. Story
Purdue University

A. Siegel
Wayne State University

INDIANA--continued

L. Dunkle
ARS-USDA

IOWA
W. R. Fehr
Iowa State University

R. Shibles
Iowa State University

L. H. Soderholm
Iowa State University

C. R. Stewart
Iowa State University

B. L. Deyoe
ARS-USDA
National Animal Disease Center

G. H. Frank
ARS-USDA
National Animal Disease Center

K. R. Rhoades
ARS-USDA
National Animal Disease Center

R. L. Sweat
ARS-USDA
Fort Dodge Laboratory

KANSAS

L. C. Davis
Kansas State University

W. H. Johnson
Kansas State University

Richard H. Schultz
Cutler Laboratories

KENTUCKY

G. B. Collins
University of Kentucky

D. B. Egli
University of Kentucky

F. W. Knapp
University of Kentucky

LOUISIANA

Alex Ciegler
ARS-USDA
Southern Regional Research Center

MAINE

Norman Smith
University of Maine

MARYLAND

P. Barbosa
University of Maryland

J. F. Rissler
University of Maryland

G. R. Beecher
ARS-USDA

Darrel Cole
ARS-USDA

Herschel H. Klueter
ARS-USDA

Robert Leffel
ARS-USDA

L. A. Liljedahl
ARS-USDA

MARYLAND--continued

E. V. Miller (retired)
CSRS-USDA

M. J. Paape
ARS-USDA

M. H. Rogoff
ARS-USDA

W. F. Schwiesow
ARS-USDA

C. E. Terrell
ARS-USDA

G. B. Willson
ARS-USDA

R. Radmer
Martin-Marietta Labs

MASSACHUSETTS

F. M. Ausubel
Harvard University

I. Sussex
Yale University

M. Hollick
Massachusetts General Hospital

MICHIGAN

J. M. Tiedje
Michigan State University

C. C. Muscoplat
University of Minnesota

MINNESOTA

T. Guilfoyle
University of Minnesota

E. L. Schmidt
University of Minnesota

C. C. Muscoplat
University of Minnesota

MISSISSIPPI

W. R. Fox
Mississippi State University

MISSOURI

D. G. Blevins
University of Missouri

R. P. Dowdy
University of Missouri

D. D. Randall
University of Missouri

E. H. Coe, Jr.
ARS-USDA

R. E. Shank
Washington University

NEBRASKA

A. Torres-Medina
University of Nebraska

NEW JERSEY

Bland Montencourt
Rutgers University

D. E. Kahn
Pitman-Moore, Inc.

NEW MEXICO

Walt Gould
New Mexico State University

NEW YORK

A. Jagendorf
Cornell University

H. F. Schryver
Cornell University

Larry Waller
Cornell University

O. C. Yoder
Cornell University

D. M. Soderlund
Geneva Agricultural Exp. Station

E. Dickson
Rockefeller University

C. A. Mebus
ARS-USDA
Plum Island Animal Disease Center

D. Smith
Albany Medical College

NEW YORK--continued

Gary Rumsey
Department of Interior

S. E. Snyderman
New York University

S. A. Weeks
AgWay, Inc.

NORTH CAROLINA

J. H. Britt
North Carolina State University

T. Melton
North Carolina State University

K. J. Leonard
ARS-USDA

H. LeBaron
CIBA-Geigy Corporation

NORTH DAKOTA

G. L. Pratt
North Dakota State University

I. A. Schipper
North Dakota State University

H. W. Evans
ARS-USDA

OHIO

D. Coplin
Ohio Agrl. Res. & Dev. Center

Warren Roller
Ohio Agrl. Res. & Dev. Center

John G. Streeter
Ohio Agrl. Res. & Dev. Center

John Allen
Battelle Memorial Institute

E. S. Lipinsky
Battelle Columbus Laboratories

OKLAHOMA

B. L. Clary
Oklahoma State University

S. A. Ewing
Oklahoma State University

OREGON

Bryan Allee
Aqua Foods, Inc.

PENNSYLVANIA

P. R. Blankenhorn
Penn State University

Sherwood DeForest
DeForest Agri-Services

SOUTH CAROLINA

E. Rupert
Clemson University

SOUTH DAKOTA

C. D. Dybing
South Dakota State University

TENNESSEE

Conrad Chester
Oak Ridge National Laboratory

James Schreyer
Oak Ridge National Laboratory

TEXAS

H. Renshaw
Texas A&M University

R. R. Stickney
Texas A&M University

S. B. Vinson
Texas A&M University

Harold Dregne
Texas A&M University

R. F. Tabita
University of Texas

R. Drummond
ARS-USDA

TEXAS--continued

F. W. Mauer
Private Consultant

C. Garza
Baylor College of Medicine

UTAH

N. Van Alfen
Utah State University

F. Knowlton
Utah State University

R. E. Wyse
ARS-USDA

VIRGINIA

J. S. Cundiff
Virginia Polytechnic Institute

WASHINGTON

N. L. Gates
Washington State University

A. Kleinhofs
Washington State University

T. McGuire
Washington State University

Gary Schieffelbein
ARS-USDA
Pacific Northwest Laboratory

WISCONSIN

E. T. Bingham
University of Wisconsin

M. H. O'Leary
University of Wisconsin

L. H. Schultz
University of Wisconsin

J. M. Schriber
University of Wisconsin

T. J. Wegner
U.S. Forest Products Lab

WYOMING

F. E. Busby
University of Wyoming

C. Kaltenback
University of Wyoming

J. E. Lloyd
University of Wyoming

